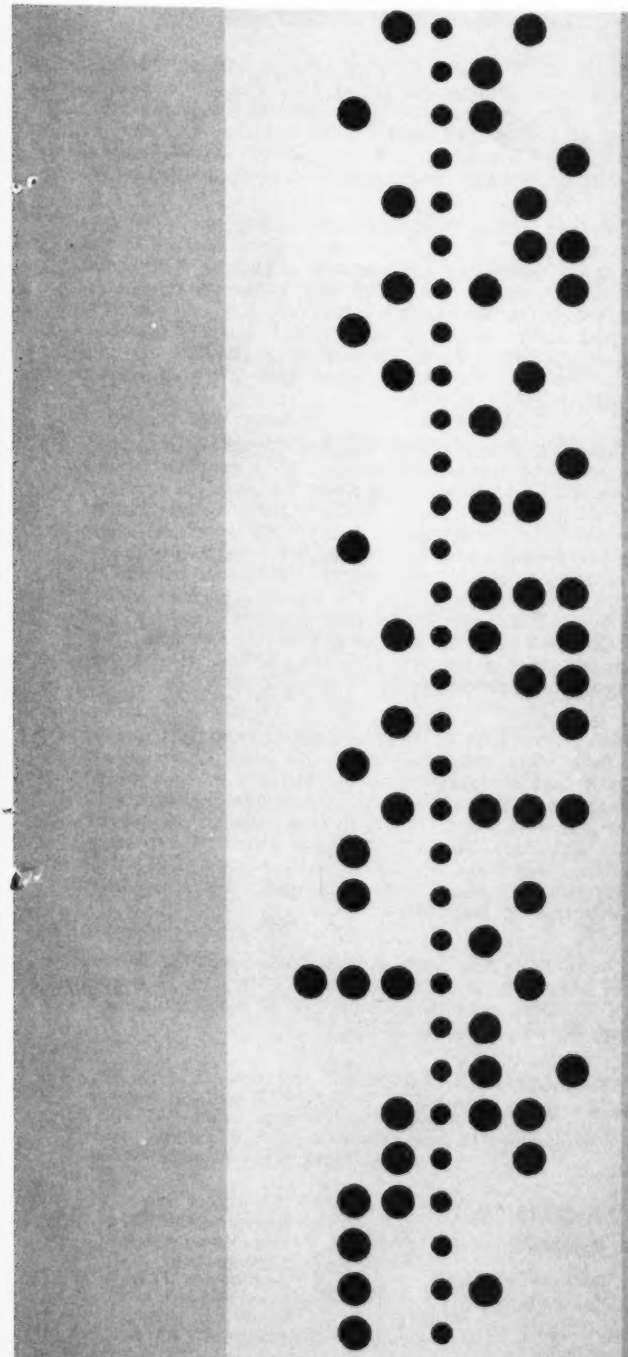
November 20, 1965

U.S. GOVERNMENT

RESEARCH & DEVELOPMENT REPORTS



A Semi-monthly Abstract Journal for Science and Industry

CLEARINGHOUSE
FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION

U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

November 20, 1965 / Volume 40, Number 22

U.S. Government

RESEARCH AND DEVELOPMENT REPORTS

Issued twice a month by the Clearinghouse for Federal Scientific and Technical Information. Annual subscription $15 ($3.75 additional for foreign mailing). Single copy $1. Make remittance payable to Superintendent of Documents and mail either to a U.S. Department of Commerce Field Office or to Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. Address changes should be sent to Superintendent of Documents.

PURPOSE

U.S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS is published by the Clearinghouse for Federal Scientific and Technical Information to announce the availability of new reports of U.S. Government-sponsored R&D released by the Department of Defense and other Federal agencies. Included are reports from the Atomic Energy Commission and the National Aeronautics and Space Administration, which issue separate announcement journals as noted below.

FORMAT

USGRDR contains two sections with a combined table of contents. The first section, "Technical Abstract Bulletin" (TAB), announces reports released by the Defense Documentation Center (DDC) of the Department of Defense. The second section, "Other Research Reports and Related Material," announces reports released by civilian agencies and also includes certain older military reports. Reports are listed by accession/report number under 22 major subject category headings. Both sections contain abstracts and complete bibliographic citations and are followed by their respective indexes. Reports of current high industrial interest are featured in "Research Highlights."

HOW TO USE

Readers are urged to review all abstracts in their fields of interest, noting accession/report numbers and titles of reports to be ordered. Although primarily for retrieval, the descriptors provide a quick grasp of a report's scope. The reader is reminded that reports applicable to his field may be found under various subject category headings; the various indexes will aid in locating those reports. A single reference guide to new Government-sponsored technical literature, *Government-Wide Index to Federal Research and Development Reports*, is compiled monthly by the Clearinghouse from the combined indexes of this journal, *Nuclear Science Abstracts* (AEC), *Scientific and Technical Aerospace Reports* (NASA), and *Technical Abstract Bulletin* (DDC). This combined index is available from Superintendent of Documents, U.S. Government Printing Office, annual subscription $16, ($4.00 for foreign mailing) or $1.75 single copy.

TO ORDER REPORTS

All reports announced herein are available to the general public from the Clearinghouse, or in some cases from other sources as noted. To order Clearinghouse reports, use accession/report number (as given on the first line of each entry) and title from the Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151, or from any Commerce Field Office (listed on inside back cover). Prices for hard copy (HC) and microfiche copy (MF) are given for each entry. Prepayment is required unless purchases are to be charged to Clearinghouse deposit accounts. Order forms will be found in the back. Make check or money order payable to National Bureau of Standards—CFSTI.

OTHER JOURNALS

Reports of the National Aeronautics and Space Administration and the Atomic Energy Commission can be ordered from the Clearinghouse. They are abstracted in the following journals available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NUCLEAR SCIENCE ABSTRACTS, Atomic Energy Commission, $30 a year domestic, $37 foreign, $1.75 single copy plus 25 percent foreign mailing.

SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS. National Aeronautics and Space Administration, $33.00 a year domestic, $42.00 foreign, $2.50 single copy plus 25 cents foreign mailing.

U.S. DEPARTMENT OF COMMERCE
John T. Connor, Secretary

CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION
Springfield, Va. 22151
Bernard M. Fry, Director

Contents may be printed freely. Mention of source will be appreciated. Use of funds for this publication approved by the Director of the Bureau of Budget, June 30, 1961.

special ANNOUNCEMENTS

CLEARINGHOUSE BEGINS INTERNSHIP PROGRAM

Recent science and engineering graduates, documentalists, and science librarians have the opportunity to acquire first-hand knowledge and work experience in the operation of the U. S. Department of Commerce's Clearinghouse for Federal Scientific and Technical Information. Recent graduates of accredited institutions can enter a one year internship program to learn the modern methods used by the Clearinghouse to handle large volumes of Federal scientific and technical information.

According to Bernard M. Fry, Director of the Clearinghouse, the program is designed to provide a unique and challenging experience for recent graduates who want to make a career in information science fields. The program trains the intern by giving him a broadly based work experience upon which he may build a career in science documentation and information handling.

Appointments will be made for one year in the Civil Service grades of GS-5 ($5,181 per annum), GS-7 ($6,269 per annum), or GS-9 ($7,479 per annum). The grade level will depend upon the applicant's education and/or experience. Applicants must be United States citizens. Some interns may be considered for permanent appointment in the important and rapidly growing Clearinghouse programs.

Inquiries concerning the program should be addressed to Intern Coordinator (410.22), Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Springfield, Va. 22151.

USGRDR GOES TO AUTOMATIC PHOTOCOMPOSITION

Another phase of our continuing program to improve the appearance and utility of the USGRDR is underway. The white section (Technical Abstract Bulletin) is now prepared on computer-actuated photocomposition equipment. The blue section (Other Research Reports and Related Material) will be included shortly in this new system of photocomposition to produce a journal of uniform printing format.

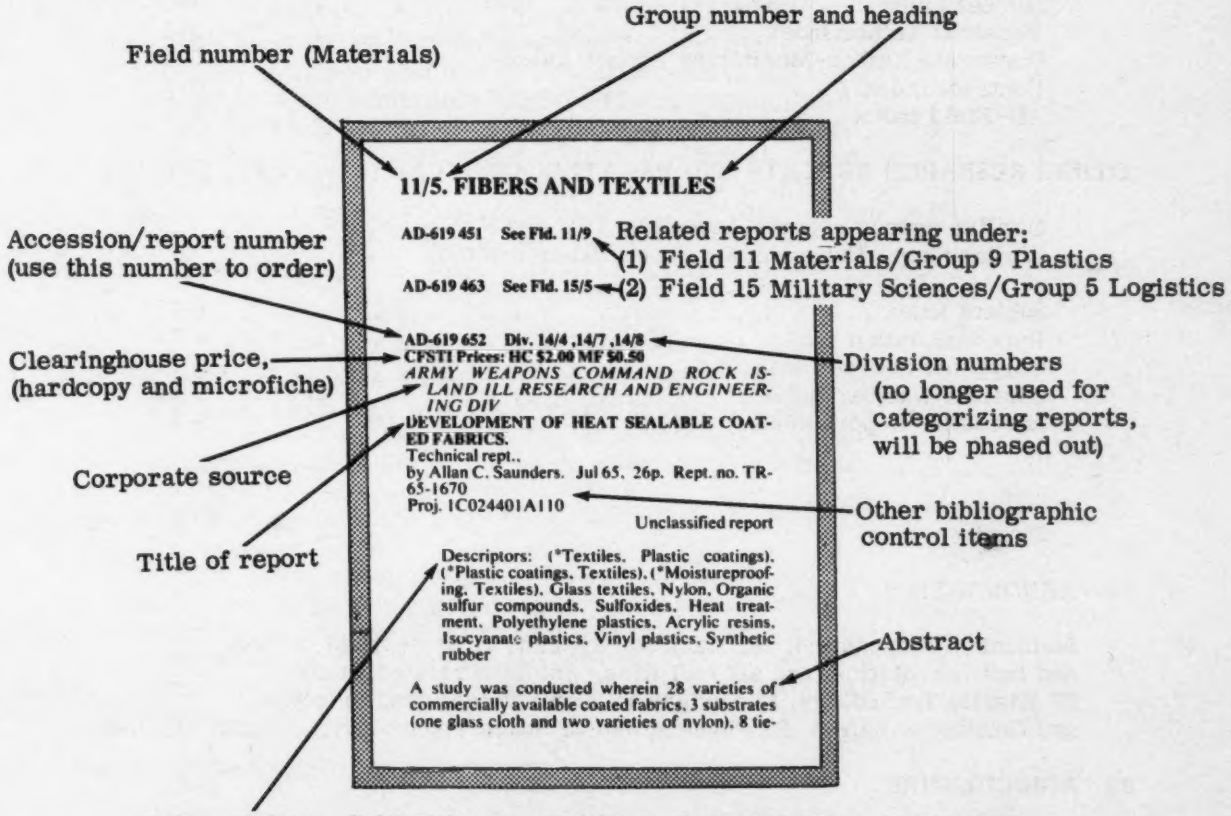
Automatic photocomposition of the USGRDR starts with the document records (indexing data and abstracts) prepared on punched paper tape at the Clearinghouse. This tape is then put through a series of computer conversion processes for insertion into automatic photocomposition equipment at the U. S. Government Printing Office. From the final computer input the photocomposition equipment produces page length columns with justified margins. These columns are then assembled into complete journal pages for photo-offset printing.

Advantages of the new format are the contrasting type faces and greater compactness, making the entries easier to scan. Perhaps of more intrinsic value is the new computer-directed cross-reference system that refers the reader to related reports announced under other Fields and Groups, some of which may at first appear to be remote from the reader's primary field of interest. Thus in the sample entry on the opposite page, the reader interested in Fibers and Textiles--Group 5 under Field 11 (Material)--is referred not only to an applicable report in Group 9 under the same Field, but also to a related report in Field 15/Group 5, (Military Sciences/Logistics).

As in all projects involving new equipment and procedures it is inevitable that some errors will occur. These will be eliminated in future issues.

The indexes to both sections of the journal will continue to be processed in the conventional manner without automatic photocomposition.

A SAMPLE ENTRY


Group number and heading
Field number (Materials)
11/5. FIBERS AND TEXTILES
Accession/report number (use this number to order)
AD-619 451 See Fld. 11/9
AD-619 463 See Fld. 15/5
Related reports appearing under:
(1) Field 11 Materials/Group 9 Plastics
(2) Field 15 Military Sciences/Group 5 Logistics
AD-619 652 Div. 14/4 ,14/7 ,14/8
Clearinghouse price, (hardcopy and microfiche)
CFSTI Prices: HC $2.00 MF $0.50
Division numbers (no longer used for categorizing reports, will be phased out)
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
Corporate source
DEVELOPMENT OF HEAT SEALABLE COATED FABRICS.
Technical rept.,
by Allan C. Saunders. Jul 65, 26p. Rept. no. TR-65-1670
Proj. 1C024401A110
Other bibliographic control items
Unclassified report
Title of report
Descriptors: (*Textiles, Plastic coatings), (*Plastic coatings, Textiles), (*Moistureproofing, Textiles), Glass textiles, Nylon, Organic sulfur compounds, Sulfoxides, Heat treatment, Polyethylene plastics, Acrylic resins, Isocyanate plastics, Vinyl plastics, Synthetic rubber
Abstract
A study was conducted wherein 28 varieties of commercially available coated fabrics, 3 substrates (one glass cloth and two varieties of nylon), 8 tie-
Descriptors: Subject terms used for cross-reference and retrieval; starred descriptors appear in subject index.

NOTE: As a referral service only, some entries cite articles in non-Government journals, certain Government Printing Office publications, and similar documents which may be of interest to Clearinghouse customers.

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01 AERONAUTICS

Includes aerodynamics; aeronautics; aircraft; aircraft flight control and instrumentation; and air facilities. See also related fields: 16 Missile Technology, 17 Navigation, Communications, Detection, and Countermeasures, 20 Physics, and 22 Space Technology..... 1, S-1

02 AGRICULTURE

Includes agricultural chemistry; agricultural economics; agricultural engineering; agronomy and horticulture; animal husbandry; and forestry. See also related field: 06 Biological and Medical Sciences..... 3, S-5

03 ASTRONOMY AND ASTROPHYSICS

Includes astronomy; astrophysics; and celestial mechanics..... 3, S-5

04 ATMOSPHERIC SCIENCES

Includes atmospheric physics and meteorology..... 5, S-6

05 BEHAVIORAL AND SOCIAL SCIENCES

Includes administration and management; documentation and information technology; economics; history, law and political science; human factors engineering; humanities; linguistics; man-machine relations; personnel selection, training, and evaluation; psychology (individual and group behavior); and sociology. See also related field: 06 Biological and Medical Sciences..... 7, S-13

06 BIOLOGICAL AND MEDICAL SCIENCES

Includes biochemistry; bioengineering; biology; bionics; clinical medicine; environmental biology; escape, rescue, and survival; food; hygiene and sanitation; industrial (occupational) medicine; life support; medical and hospital equipment and supplies; microbiology; personnel selection and maintenance (medical); pharmacology; physiology; protective equipment; radiobiology; stress physiology; toxicology; and weapon effects. See also related fields: 02 Agriculture, 05 Behavioral and Social Sciences, and 07 Chemistry..... 23, S-16

07 CHEMISTRY

Includes chemical engineering; inorganic chemistry; organic chemistry; physical chemistry; and radio and radiation chemistry. See also related fields: 06 Biological and Medical Sciences, 11 Materials, 20 Physics, and 21 Propulsion and Fuels..... 39, S-19

08 EARTH SCIENCES AND OCEANOGRAPHY

Includes biological oceanography; cartography; dynamic oceanography; geochemistry; geodesy; geography; geology and mineralogy; hydrology and limnology; mining engineering; physical oceanography; seismology; snow, ice, and permafrost; soil mechanics; and terrestrial magnetism. See also related field: 04 Atmospheric Sciences..... 42, S-22

09 ELECTRONICS AND ELECTRICAL ENGINEERING

Includes components; computers; electronic and electrical engineering; information theory; subsystems; and telemetry. See also related fields: 10 Energy Conversion (Non-propulsive) and 20 Physics..... 46, S-24

10 ENERGY CONVERSION (Non-Propulsive)

Includes conversion techniques; power sources; and energy storage. See also related fields: 09 Electronics and Electrical Engineering and 20 Physics..... 55, S-30

11 MATERIALS

Includes adhesives and seals; ceramics, refractories, and glasses; coatings, colorants, and finishes; composite materials; fibers and textiles; metallurgy and metallography; miscellaneous materials; oils, lubricants, and hydraulic fluids; plastics; rubbers; solvents, cleaners, and abrasives; and wood and paper products. See also related fields: 07 Chemistry, 13 Mechanical, Industrial, Civil, and Marine Engineering, and 21 Propulsion and Fuels..... 56, S-32

12 MATHEMATICAL SCIENCES

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Includes air conditioning, heating, lighting, and ventilating; civil engineering; construction equipment, materials, and supplies; containers and packaging; couplings, fittings, fasteners, and joints; ground transportation equipment; hydraulic and pneumatic equipment; industrial processes; machinery and tools; marine engineering; pumps, filters, pipes, tubing, fittings, and valves; safety engineering; and structural engineering. See also related fields: 07 Chemistry and 09 Electronics and Electrical Engineering..... 63, S-42

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Includes antisubmarine warfare; chemical, biological, and radiological warfare; defense; intelligence; logistics; nuclear warfare; and operations, strategy, and tactics. See also related fields: 16 Missile Technology and 17 Navigation, Communications, Detection and Countermeasures..... 68, S-51

16 MISSILE TECHNOLOGY

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17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

Includes acoustic detection; communications; direction finding; electromagnetic and acoustic countermeasures; infrared and ultraviolet detection; magnetic detection; navigation and guidance; optical detection; radar detection; and seismic detection. See also related fields: 09 Electronics and Electrical Engineering and 20 Physics..... 73, S-53

18 NUCLEAR SCIENCE AND TECHNOLOGY

Includes fusion devices (thermonuclear); isotopes; nuclear explosions; nuclear instrumentation; nuclear power plants; radiation shielding and protection; radioactive wastes and fission products; radioactivity; reactor engineering and operation; reactor materials; reactor physics; reactors (power); reactors (non-power); and SNAP technology. See also related fields: 07 Chemistry, 15 Military Sciences, 18 Nuclear Science and Technology, 20 Physics, and 21 Propulsion and Fuels..... 75, S-54

19 ORDNANCE

Includes ammunition, explosives; bombs; combat vehicles; explosions, ballistics, and armor; fire control and bombing systems; guns; rockets; and underwater ordnance. See also related field: 18 Nuclear Science and Technology..... 76, S-59

20 PHYSICS

Includes acoustics; crystallography; electricity and magnetism; fluid mechanics; masers and lasers; optics; particle accelerators; particle physics; plasma physics; quantum theory; solid-mechanics; solid-state physics; thermodynamics and wave propagation. See also related fields: 03 Astronomy and Astrophysics, 07 Chemistry, 09 Electronics and Electrical Engineering, 10 Energy Conversion (Non-propulsive), 11 Materials, 13 Mechanical, Industrial, Civil, and Marine Engineering, and 17 Navigation, Communications, Detection, and Countermeasures..... 77, S-62

21 PROPULSION AND FUELS

Includes air-breathing engines; combustion and ignition; electric propulsion; fuels; jet and gas turbine engines; nuclear propulsion; reciprocating engines; rocket motors and engines; and rocket propellants. See also related fields: 07 Chemistry and 20 Physics..... 93, S-68

22 SPACE TECHNOLOGY

Includes astronautics; spacecraft; spacecraft trajectories and reentry; and spacecraft launch vehicles and ground support. See also related fields: 01 Aeronautics, 03 Astronomy and Astrophysics, 16 Missile Technology, 17 Navigation, Communications, Detection, and Countermeasures, and 21 Propulsion and Fuels..... 96, S-70

RESEARCH highlights

Reports of current high industrial interest

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Chemical Processing

PHYSICAL PROPERTIES OF FUSED SALTS

(Order SC-R-65-930, V. 1, Physical Properties of Fused Salt Mixtures, HC $7.00.)

A compilation of physical properties of fused salt mixtures prepared by Sandia Laboratory consists of two complementary tables of mixtures with eutectic compositions and melting points. The composition of all systems is reported in mole %. Sandia used an extensive literature survey to locate information from 1907 through 1962 of the Illinois Institute of Technology Research Institute. They note that the data for fused salt mixtures have become so voluminous that it is impossible for an individual to be aware of all that is available. Use of fused salts is extensive in industry in the production of alkali and other metals, as a base for circulating liquid fuels, in nuclear reactors, in the fluxing and descaling of metals, and as heat transfer agents. The work, therefore, should be of value to many in the chemical processing field. A complete list of references is also included for rapidly locating system components and systems covered. Additional data are being revised and will be published in future reports.

RADIATIVE PROPERTIES OF GASES

(Order AD-619 266 Radiative Properties of Gases. Volume I. General Discussions HC $6.00/MF $1.25.)

The problem of how to determine spectral intensities of molecular species at high temperature is described in a report prepared for the Navy by the Rocketdyne Division of North American Aviation. The report describes the basic radiative properties of high temperature gases with primary emphasis on methods of calculating spectral absorption coefficients of electronic transitions in diatomic molecules. Rocketdyne used the smeared line model to calculate absorption coefficients in fifty such transitions. Ancillary work included studies of methods for calculating numerical potential functions of the Rydberg-Klein-Rees type, solutions to the Schroedinger Franck-Condon, and r-centroid factors. One hundred and fifty graphs give calculated spectral absorption coefficients at several high temperatures for molecules of interest in atmospheric processes.

Electrical

A six-volume study in the field of linear beams and microwave power recently completed for the Air Force Systems Command is a comprehensive theoretical and experimental treatment of multicavity klystrons from the viewpoint of efficiency enhancement by means of dc voltage biased gaps. Prepared in April 1965 by Cornell University's School of Electrical Engineering, the reports also describe studies of linear beams and their interaction with appropriate circuits. During the course of the work, Cornell devised new methods of generating small dense electron beams and investigated their interactions with a plasma. The overall purpose of the effort was to provide a better understanding of the phenomena and their applications to the effective generation and amplification of high-frequency high-power microwave signals. According to a Federal evaluator, the work contains valuable information for people specializing in high-power multicavity klystrons since it presents the state-of-the-art in that area.

BASIC BEAM PHENOMENA

(Order AD-615 961 Investigation of Linear Beam and New Concepts of Microwave Power. Vol. I. General Report and Basic Beam Phenomena, HC $6.00/MF $1.50.)

Volume I gives a brief survey of all the work done at Cornell in high-power multicavity klystrons, including "plasma interaction" in klystrons and "laser emission." It also presents the results of four separate studies. Discussed first is a theoretical and experimental study of the propagation of space-charge waves along an electron beam with a periodically varying beam diameter. The second study is concerned with noise growth phenomena in Brillouin beams. Progress made on the design of immersed electron beams follows, and the last one is a comprehensive effort concerned with the growth of peak electron velocity, noise, and signals in magnetically focused electron beams. Insight into the nature of these phenomena, say the researchers, may disclose means whereby clean electron beams will lead to new classes of electron devices.

BEAM-CIRCUIT ACTION

(Order AD-615 939 Investigation of Linear Beam and New Concepts of Microwave Power. Volume II. Beam-Circuit Action, HC $6.00/MF $1.25.)

Volume II describes a method to improve the gain and the efficiency of conventional klystrons by varying the beam impedance through a change of dc beam voltage at appropriate locations along the beam. Researchers present results in both small- and large-signal analyses for two- and three-cavity klystrons with gridded and gridless-gap resonators. They derived analytical expressions of beam-loading conductance for a transformed beam interacting with both gridded and gridless-gap resonators.

BEAM-CIRCUIT INTERACTION

(Order AD-615 962 Investigation of Linear Beam and New Concepts of Microwave Power. Vol. III. Beam-Circuit Interaction, HC $6.00/MF $1.25.)

Volume III indicates the basic factors affecting klystron efficiency: (1) Modulation coefficients or coupling coefficients; (2) small and large signal beam-loading conductance; and (3) input conditions of current modulation and velocity modulation. The first two factors are dependent primarily on the output circuit configuration, and the circuit should provide both a negative beam-loading conductance and also a reasonably high coupling coefficient. The third factor is dependent on the input cavity configuration. This configuration should be designed to have as high a current modulation as possible and to have the velocity modulation at a favorable phase with the current modulation.

NANOSECOND PULSE STUDY

(Order AD-615 963 Investigation of Linear Beam and New Concepts of Microwave Power. Vol. IV. Nanosecond Pulse Study, HC $4.00/MF $1.00.)

Volume IV develops a theory for the nonlinear behavior of an electron beam velocity-modulated by an ideal gap and of finite cross-section filling a conducting cylinder. A strong axial magnetic field allows the motion of electrons in the axial direction only. Using a method of successive approximations, researchers derived an expression for the current density. They say the expression cannot be expected to apply directly to an actual klystron, but since the space-charge forces were taken into account explicitly, they believe these results provide insight into the nonlinear behavior of velocity-modulated tubes.

INTERACTION OF HIGH-POWER ELECTRON BEAM AND PLASMA

(Order AD-615 940 Investigation of Linear Beam and New Concepts of Microwave Power. Vol. V. Interaction of High-Power Electron Beam and Plasma, HC $6.00/MF $1.50.)

Volume V describes how a Penning discharge was used to generate in hydrogen a plasma suitable for use in a microwave electron beam-plasma amplifier. Researchers obtained plasma densities on the order of 10^{11} electrons per cubic centimeter. They developed a two-fluid theoretical model of the plasma to explain the operation of the discharge. The model is supported by diagnostic measures of two

kinds — microwave-cavity measurements and probe measurements. The researchers also say the detuning of a resonant microwave cavity is a fast and reliable method for measuring the average plasma density. Probe measurements provided information on the average plasma-electron energies and on the shape of the radial plasma-density profile.

LASER-STIMULATED ELECTRON EMISSION

(Order AD-616 001 Investigation of Linear Beam and New Concepts of Microwave Power. Vol. VI. Laser-Stimulated Electron Emission, HC $5.00/MF $1.00.)

Volume VI examines the diffusion of time-varying magnetic fields through conductors and applies the quantitative results to pulsed solenoids to obtain the axial magnetic fields. Researchers say the results obtained for test solenoids will facilitate their design and construction. Conductor thickness (on the radius) which can be tolerated without a large degradation in the magnitude of the field is on the order of one skin depth. If low-conductivity conductors are used, this limitation is not especially serious. On the other hand, a much more stringent limitation is placed upon the coil thickness of the pulsed solenoid where copper wire or tape is used. For a decrease of 10 to 15 percent in axial field, coil thickness of up to twice the skin depth can be used.

Engineering and Construction

COMPUTER PROGRAM USED TO CHECK ELASTIC BEHAVIOR

(Order AD-619 775 Computer Analysis of Plane Frames, HC $2.00/MF 50 cents.)

A computer program to check the elastic behavior of a series of braced and unbraced multistory steel frames has been successfully used at Lehigh University. The program will handle any type of plane frame consisting of prismatic members, and it will analyze any number of load sets. Thus it is possible to get a complete matrix of influence coefficients for stress or deflection.

Lehigh University researchers, jointly sponsored by the Navy and the Welding Research Council, say that pin jointed frames and mixtures of flexural and axially strained members in braced multistory frames are also handled by this computer program. The effects of temperature, shrinkage, or lack of fit can be included. The basic method of analysis is by displacement, which is generally preferred to the alternative force method for structural frames because the former requires less data preparation. This applies to frames of few redundancies but many degrees of freedom. The displacement method is easier to understand as it is a more general form of the traditional method of slope-deflection analysis.

The basic data fed into the computer consists of information about the degree of freedom, the number of flexural and axially strained members, and their relevant stiffnesses. The frame topology is conveniently described by a statics matrix. The load-sets also are required together with information about the temperature or

shrinkage deformations of each frame element considered in isolation. The output is arranged so that moments at each end of each flexural component are tabulated separately from the axial tensions for cases when both are required so that bending moment diagrams can be simply constructed. Lehigh's Fortran program has been thoroughly tested on both the GE 225 and IBM 7074 computers. Storage capacity with the GE 225 is approximately 1900 locations, and with the IBM 7074 there are 6900 locations available.

Nuclear Technology

SILICON RADIATION DETECTORS PRODUCED ROUTINELY

(Order UCRL-16190 Lithium-Drifted Silicon Radiation Detector Production Process, HC $1.00.)

Lithium-drifted silicon radiation detectors can be produced by a simple process developed by the AEC's Lawrence Radiation Laboratory. Hundreds of the devices have been made, mostly for use in counter systems for experiments with the Berkeley 88-inch cyclotron or in low temperature, high resolution beta spectroscopy. With silicon of sufficiently high quality, devices 3 mm thick with 4- to 6-keV line widths for cesium-137 betas can be produced routinely for spectroscopy. The process has four main phases: predrift, drift, postdrift, and surface treatments and electrical tests.

Optics

AUTOMATED ANALYSIS OF SPECTROMETRIC DATA

(Order AD-620 295 Computer Program for the Analysis of Visible Spectrometric Data: Chromaticity, HC $2.00/MF 50 cents.)

A computer program has been prepared by the Naval Ammunition Depot to reduce and analyze the voluminous data obtained with a Perkin-Elmer Model 108 monochromator. The program's use, however, is universal and applicable to the spectrometric data from most instruments, including the many grating spectrometers in wide use today. The program helps in the calibration of the spectrometer by analyzing collected data and printing out from the item scanned the relative radiant energy versus wavelength, relative luminous intensity (candlepower), and the x, y, and z chromaticity coordinates. The Navy study offers necessary information for computer input and a suggested format for recording this data, along with instructions for key-punching the input data cards and instructions for the computer operator.

TECHNICAL ABSTRACT BULLETIN

1/2. AERONAUTICS

AD-621 676 Div. 1/5 ,13/11
CFSTI Prices: HC $2.00 MF $0.50
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY NJ EXPERIMENTATION DIV
POST-CRASH FIRE-FIGHTING STUDIES ON TRANSPORT CATEGORY AIRCRAFT.
Final rept.,
by Don W. Conley. May 65, 39p. Proj. 430 002 01X
SRDS , RD-65-50

Unclassified report

Descriptors: (*Aircraft fires, Transport planes), (*Transport planes, Aircraft fires), Helicopters, Firefighting vehicles, Foams, Aviation safety, Poisonous gases, Fire extinguishers, Hatches, Fuselages, Tests, Burns, Pain, Tolerances (Physiology)

Information was obtained on the effectiveness of helicopter downwash and ground foam equipment in extending the escape time for aircraft occupants in a post-crash fire environment by burning five C-97 aircraft under similar conditions. Additional tests, not involving C-97 aircraft, were conducted relative to rescue path studies. Test data indicated that helicopter downwash extended the escape time when fire existed solely on the upwind side of a C-97 fuselage, but reduced the escape time when fire was on both sides or solely on the downwind side of the fuselage. It was also found that helicopter downwash provided a considerable reduction in the radiant heat and air temperature in a simulated rescue path. For the standard fire condition used and the equipment employed, the ability of ground crews to extend the escape time was found to be dependent upon the preburn time and the fuselage integrity with respect to emergency doors open or closed. An escape time of 50 seconds was computed for a C-97 with emergency doors open as compared to 138 seconds for a C-97 with emergency doors closed. Test results amplify the need for a quick arrival of extinguishing equipment and a capability for a quick 'knockdown' and control of the fire. (Author)

AD-622 062 Div. 1/5 ,18/4 ,23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
INSTALLATION AND EVALUATION OF A TRAINER FOR AVIATION UNDERWATER SURVIVAL.
Special rept.,
by Arthur L. Hall. 23 Feb 56, 25p. Rept. no. SR-56-4

Unclassified report

Descriptors: (*Survival, Sea rescue equipment), (*Aviation accidents, Sea rescue equipment), (*Sea rescue equipment, Aviation accidents), (*Training devices, Sea rescue equipment), Naval aviation, Aviation personnel, Ditching, Rescue kits, Underwater equipment, Oxygen, Breathing masks, Flight clothing, Feasibility studies

In 1952 it was found that standard naval aviation oxygen equipment operated satisfactorily under water. The Chief of Naval Air Training desired that this equipment be installed and evaluated for a possible training program in aviation underwater survival. Standard naval aviation oxygen equipment was installed in a Dilbert Dunker and as a portable installation for training purposes. In addition, diving equipment was made for a 'Safety Diver.' All apparatus operated successfully. Installation and evaluation is detailed in the report. Equipment and personnel required for operation of the apparatus, as well as a sample lecture are included in the report. (Author)

AD-622 291 Div. 1/4 ,1/2
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
METHODS OF ANALYSIS OF FLIGHT VIBRATION MEASUREMENTS,
by J. P. Kearns. 19 Dec 55, 26p. Rept. no. APL/JHU CF-2422
Contract NOrd7386

Unclassified report

Descriptors: (*Vibration, Measurement), (*Flight, Vibration), Fourier analysis, Series, Band-pass filters, Acceleration, Dynamics

A method of analysis of flight vibration measurements is required to provide information for development of design analyses and test procedures. The method of analysis is governed by the objectives of the overall engineering program. The first objective is to design systems whose components will not be subject to severe vibrations in frequency zones of high sensitivity. The second objective is to devise tests which will establish the reliability of the actual system in the presence of realistic vibrations. In the analysis of the flight wave, it would be desirable to extract the exact Fourier component amplitudes corresponding to each multiple of a low fundamental frequency, and thereby produce an exact mathematical representation of the wave. Techniques which are presently available cannot produce such a representation. Rather, they are limited to finding the sums of the squares of the Fourier coefficients over a given frequency band. Information about the instantaneous value of the wave is lost and what emerges is a 'power spectral density' or 'Fourier Coefficient Strength' versus frequency. It is learned that this kind of an analysis, taken with an appropriate electro-dynamical transfer function, will produce root mean square values of any electrical or mechanical quantity at any point. But the instantaneous value of any quantity is unpredictable. One way of making up for the lost information is to measure the output of various electro-dynamical systems when driven by the complex wave. A study can then be made of the percentage of the time the output is above any reference output. (Author)

AD-621 636 See Fld. 5/4

AD-621 673 See Fld. 17/7

AD-621 718 See Fld. 1/3

AD-622 064 See Fld. 1/3

AD-622 078 See Fld. 15/5

AD-622 152 See Fld. 1/5

AD-622 254 See Fld. 6/16

AD-622 255 See Fld. 6/16

1/3. AIRCRAFT

AD-621 684 Div. 1/2
CFSTI Prices: HC $7.00 MF $2.00
HUGHES TOOL CO CULVER CITY CALIF AIRCRAFT DIV
AIRCRAFT DESIGN XV-9A HOT CYCLE RESEARCH AIRCRAFT.
Final summary rept. for 28 Sep 62-15 Mar 65,
by Norman B. Hirsh. Aug 65, 326p. Rept. no. HTC-AD-64-11 (385-X-05)
Contract DA44 177AMC877T Task 1M121401A14403
USAAVLABS , TR-65-29

Unclassified report

See also AD-613 339.

Descriptors: (*Vertical take-off planes, Rotary wings), Design, Gas generator engines, Jet propulsion, Rotor blades (Rotary wings), Aerodynamic configuration, Weight, Payload, Flight control systems, Hovering, Level flight, Stability, Aerodynamic loading, Aerodynamic characteristics, Performance (Engineering)

A summary of the design of the XV-9A Hot Cycle Research Aircraft is presented. A discussion of the concepts utilized in design and additional information relating to configuration, weight and balance, performance, stability and control, dynamics, and structural characteristics are presented. (Author)

AD-621 718 Div. 1/2 ,1/5
CFSTI Prices: HC $4.00 MF $0.75
AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ
SURVIVABILITY SEAT DESIGN DYNAMIC TEST PROGRAM.
Final technical rept.,
by L. W. T. Weinberg, and James W. Turnbow.
Jul 65, 125p. Contract DA44 177AMC191T
Task 1P121401A1500301
USAAVLABS , TR-65-43

Unclassified report

Descriptors: (*Aircraft seats, Design), Aviation safety, Helicopters, Loading (Mechanics), Failure (Mechanics), Tests, Acceleration, Safety harness, Survival, Graphics, Specifications

The report presents the results of a series of dynamic tests conducted with four different concepts of experimental crew seats. The experimental seats were designed and constructed by four helicopter manufacturers. The seats were designed to withstand static load factors equivalent to those recommended in TRECOM Technical Report 63-4, 'Crew Seat Design Criteria for Army Aircraft', dated February 1963. The design load factors recommended in the above referenced report were as follows: longitudinal-45G for 0.10 second; lateral-45G for 0.10 second; and vertical-25G for 0.10 second. Special kits for small arms ballistics protection were also designed and installed in the seats tested. These seats were designed exclusively using static load factors. No previous testing was conducted by any seat manufacturer prior to the conduct of these tests. The four seats were tested under four load conditions. Two of the conditions involved simultaneous half loads on the seats in two different seat positions, and two of the conditions involved full loads in two different seat positions. Only one of the four seats tested withstood the loads imposed for all four conditions. Three of the seats failed and were damaged beyond economical repair when each was subjected to the first full load test condition. The report also includes a detailed description of an acceleration device which was specially designed and fabricated for this series of tests. (Author)

AD-621 777 Div. 1/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF COMPENSATING THE AIRPLANE'S TURNING MOMENT IN LANDING WITH A BRAKE PARACHUTE IN A STRONG SIDE WIND,
by Ya. A. Livshits, and M. S. Aretskin. 20 Sep 65, 5p. Rept. no. FTD-TT-65-506
TT , 65-64041

Unclassified report

Unedited rough draft trans. of Russian patent 163 079, pub. 23 Jan 62, appl. 761697/50-23, 1p.

Descriptors: (*Drag parachutes, Airplanes), (*Landing aids, Airplanes), Aircraft landings, Brakes, Patents, USSR

The object of the invention is a method for compensating the turning moment of an airplane on landing with a brake parachute under conditions of a strong side wind which has the distinguishing feature that for the purpose of assuring a safe run of the airplane one releases after the basic brake parachute one of two supplementary stabilizing parachutes, as depends on the direction of the side wind, located on the wings symmetrically at the greatest distance from the center of gravity of the airplane. (Author)

AD-621 892 Div. 1/9 ,27/2
CFSTI Prices: HC $2.00 MF $0.50
ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA
PRELIMINARY FLIGHT TEST DATA UH-2A WITH HORIZONTAL THRUST AUGMENTATION PROVIDED BY A YJ-85 TURBO-JET ENGINE.
Interim rept. no. 3, 22 Jan-3 Apr 64.
Jun 64, 32p.

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Helicopters, Flight testing), (*Turbojet engines, Thrust), Propulsion, Rotor blades (Rotary wings), Control, Vibration, Aerodynamic loading

The report summarizes the flight testing conducted on UH-2 helicopter BuNo. 147978, modified by the installation of a YJ85 turbo-jet engine for auxiliary propulsion, during the period 22 January 1964 through 3 Apr 1964. A total of 42 flights, involving 28.3 hours of aircraft time were conducted. (Author)

AD-621 893 Div. 1/9 ,27/2
CFSTI Prices: HC $2.00 MF $0.50
ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA
PRELIMINARY FLIGHT TEST DATA XH-51A RIGID ROTOR HIGH SPEED FLIGHT PROGRAM.
Interim rept. no. 9.
Dec 64, 37p.

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Helicopters, Flight testing), (*Jet engines, Helicopters), Tail helicopter rotors, Propulsion, Performance (Engineering), Wings, Stability, Maneuverability, Stresses, Vibration, Loading (Mechanics)

The report summarizes the flight test results of XH-51A compound helicopter testing. For this program, an XH-51A helicopter was modified to incorporate a wing and a J-60 auxiliary jet engine. The purpose of this phase was to obtain flight test data on performance, stability, maneuverability, critical stresses and vibration at speeds up to an objective of 200 knots. The data included present the results in these areas at speeds up to a level flight true airspeed of 210 knots. (Author)

AD-621 959 Div. 1/7 ,2/7
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
TETHERED AEROLOGICAL BALLOON SYSTEM,
by Shelden D. Elliott,Jr., J. M. McKay, and J. B.McKee. Sep 65, 42p. Rept. no. TPR-398, NOTS-TP-3830
Contract AT49 7 2341 Proj. arpa order 594 Task R360FR106 216 1R011 01 01

Unclassified report

Descriptors: (*Meteorological balloons, Mooring), Stratosphere, Inflatable structures, Polyethylene plastics, Glass textiles, Epoxy plastics, Telemeter systems, Ground support equipment, Tensile properties, Drag, Lift, Instrumentation, Manned

The tethered aerological balloon system (TABS) currently under development at NOTS is designed to maintain a captive balloon and payload at stratospheric altitudes for an indefinite period of time, taking advantage of the region of minimum wind velocity nearly always present at some level in the lower stratosphere. The system consists of (1) a conventional polyethylene balloon fitted with a self-deploying reefing system to reduce lateral drag; (2) an airborne telemetry-command package capable of monitoring up to six aerological or other parameters concurrently (additional packages may be distributed along the tether as needed); (3) a NOTS-developed glass fiber tether having a tensile strength comparable to that of steel, at one-fourth the latter's weight, fabricated in splice-free lengths exceeding 100,000 feet; and (4) a mobile ground vehicle from which all functions subsequent to launch can be performed, carrying a crew, control winch, and equipment to communicate with a ground telemetry and command station; the vehicle can run with the wind to reduce lateral drag loads on ascent or descent. The system is expected to become operational the fall of 1965. Various uses and possible further developments of such a stratospheric moored platform are discussed, including applications to manned systems. (Author)

AD-622 064 Div. 1/3 ,1/5
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
INSTALLATION AND EVALUATION OF TV-2 TYPE ARM RESTS ON SPECIAL DEVICE, 6-EQ-2A, EJECTION SEAT TRAINER.
Special rept.,
by Perry W. Gard, and Leroy B. Cochran. 24 Apr 56, 16p. Rept. no. SR-56-16

Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Training devices, Ejection seats), (*Ejection seats, Training devices), Installation, Tests, Aviation safety

The possibility of modifying the 6-EQ-2a ejection seat trainer to incorporate TV-2 type ejection seat procedure was investigated in the interest of improved pilot training. The modification of the 6-EQ-2a ejection seat trainer was accomplished and proved to work successfully, utilizing either face curtain or arm rest firing technique. The safety of the trainee was significantly improved. It is recommended that this modification be installed on all Navy ejection seat trainers to permit indoctrination in TV-2 type ejection procedure. It is further recommended that ejection seat training be modified to include indoctrination in ejection procedures, utilizing Device 6-EQ-2a or Device 6-EQ-2b, in two phases: (a) arm rest firing just prior to flight in TV-2 type aircraft, and (b) face curtain firing prior to flight in aircraft equipped with same. If recommendation number 5 is approved and put into effect, it is believed that safety of flight will be materially improved. (Author)

AD-622 205 Div. 1/2 ,1/3
CFSTI Prices: HC $3.00 MF $0.75
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
A QUALITATIVE DISCUSSION OF THE STABILITY AND CONTROL OF VTOL AIRCRAFT DURING HOVER (OUT OF GROUND EFFECT) AND TRANSITION.
Master's thesis,
by Paul J. Weitz. 1964, 70p.

Unclassified report

Descriptors: (*Vertical take-off planes, Hovering), Stability, Control, Damping, Ailerons, Yaw, Deflection, Ducted fans, Propellers (Aerial), Pitch (Motion), Jet planes, Turbojet engines, Thrust, Research planes

A survey of the latest available literature was made in order to qualitatively discuss stability and control problems of vertical takeoff and landing (VTOL) aircraft during hover (out of ground effect) and the transition to level flight. Modes of propulsion and methods of performing the transition maneuver are discussed. Comparisons are made of the various methods utilized for providing control forces at zero and very low speeds. The need for quantitative control power requirements and handling qualities criteria is presented. The instability of VTOL aircraft while hovering is discussed, as are the basic reasons for the poor damping characteristics at low speeds. Problems which have been encountered to date with research aircraft and which are peculiar to a given VTOL mode are discussed by mode. The need for automatic stabilization and precision instrumentation requirements are presented. (Author)

AD-621 704 **See Fld. 14/2**

AD-621 916 **See Fld. 11/8**

AD-622 291 **See Fld. 1/2**

1/4. AIRCRAFT FLIGHT INSTRUMENTATION

AD-621 678 Div. 1/1
CFSTI Prices: HC $4.00 MF $1.00
ROSEMOUNT ENGINEERING CO MINNEAPOLIS MINN DEPT OF AERONAUTICAL RESEARCH
EVALUATION OF FACTORS AFFECTING THE CALIBRATION ACCURACY OF AIRCRAFT STATIC PRESSURE SYSTEMS.
Technical rept.,
by Richard V. DeLeo, Floyd W. Hagen, Robert R.Kooiman, and Donald I. Thompson. Jul 65, 133p. Rept. no. REC-66227
Contract AF33 600 42754 Proj. 8201 Task 820112
SEG , TR-65-35

Unclassified report

Descriptors: (*Pressurized cabins, Transport planes), (*Altimeters, Calibration), Pressure, Pressurized vessels, Deformation, Design, Aerodynamical characteristics, Standards, Barometers

Several factors affecting the calibration accuracy of flight vehicle static pressure systems were considered in some detail. The standard atmospheres used within the past 40 years are tabulated and compared. Altimeter calibration techniques and standards are discussed. The influence of pressure system leakage was evaluated both analytically and experimentally. The influence of skin irregularities in the vicinity of fuselage static pressure ports was calculated from linearized theory and the results presented in graphical form. Fuselage irregularities were measured on 18 military transport type aircraft. (Author)

AD-621 686 Div. 1/1 ,30/3
CFSTI Prices: HC $2.00 MF $0.50
ARMY AVIATION MATERIEL LABS FORT EUSTIS VA
TEST PROGRAM FOR AUTOMATIC LIGHT AIRCRAFT READINESS MONITOR (PROJECT ALARM).
Final rept.,
by F. Prince Butler, and Meyer B. Salomonsky.
Aug 65, 42p. Rept. no. USAAVLABS-TR-65-64
Proj. 1L013001A91A

Unclassified report

Descriptors: (*Helicopters, Checkout procedures), (*Monitors, Tests), Vibration, Tem-

perature, Malfunctions, Reliability, Maintenance, Flight testing, Performance (Engineering), Bearings

The report covers approximately 100 flight test hours of a U. S. Army Aviation Materiel Laboratories in-house program conducted to determine the effectiveness of the Automatic Light Aircraft Readiness Monitor (ALARM) system. The purpose of the ALARM system was to provide lower echelons with a tool for determining the airworthiness of an aircraft. The test program consisted mainly of comparing ALARM no-go indications with actual test aircraft malfunction data. The test results indicate that the ALARM system could be used to determine the airworthiness of an aircraft at first echelon if modifications were performed and an additional test program were conducted. (Author)

AD-622 247 Div. 1/1
CFSTI Prices: HC $2.00 MF $0.50
ROSEMOUNT ENGINEERING CO MINNEAPOLIS MINN AIR DATA SENSOR DEPT
DEVELOPMENT OF A DEICED, FAST RESPONSE, DUAL ELEMENT TOTAL TEMPERATURE SENSOR.
Technical rept. for Feb 61-Nov 63,
by Wendell Malin, Jon Davison, and Cornelius Krollman. Jul 65, 27p. Rept. no. REC-5644A
Contract AF33 600 42754 Proj. 8201
SEG , TR-65-36

Unclassified report

Descriptors: (*Temperature sensitive elements, Aircraft equipment), De-icing systems, Mechanical drawings, Performance (Engineering), Tests, Instrumentation

The purpose of the project was to design, develop, test, and furnish five (5) deiced, fast response, dual element total temperature sensors. Five (5) such sensors, REC Model 102CK2AY, were furnished to the USAF. The sensor design and development consisted of: (1) The design and development of a fast response, dual temperature sensing element. (2) The modification of the REC Model 102 deiced sensor housing to accept the dual element assembly and to increase the strut length to 4.5 inches. (3) The testing of the deiced, dual element total temperature sensor. The Model 102CK2AY total temperature sensor meets all of the requirements of specifications MIL-P-25726B and MIL-P-27723A, as applicable, and has a time constant of less than 0.3 seconds. The sensor is capable of accurately sensing temperatures when the sensor is subjected to a wind tunnel icing test at an indicated airspeed of 325 = 25 knots, temperature of -30 = 5C, and liquid water content of 1.25 = .25 grams per cubic meter. (Author)

AD-621 634 See Fld. 20/1

AD-622 282 See Fld. 14/3

1/5. AIR FACILITIES

AD-621 685 Div. 33/1 ,14/4
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
PORTABLE SURFACING FOR U. S. ARMY HELICOPTER LANDING PADS; ENGINEERING FIELD TESTS.
Final rept.,
by S. G. Tucker. Aug 65, 55p. Rept. no. TR-3-686
Proj. 1V021701A046 Task 1V021701A046 05

Unclassified report

Available copy for sale by U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., HC$0.50, MF$0.75 available from CFSTI.

Descriptors: (*Landing mats, Portable), (*Textiles, Landing mats), Helicopters, Plastic coatings, Vinyl plastics, Cotton textiles, Adhesives, Dust, Control systems, Performance (Engineering), Joining, Moistureproofing, Surfaces

This investigation was conducted to evaluate the performance of sewn membrane panels as a dustproof and waterproof cover for soil subgrades and as a material for rapid construction of helicopter landing pads in theaters of operations. Eight sewn panels of Tl No. 8 vinyl-coated cotton duck membrane were placed as a 100-ft-square surfacing directly on the soil subgrade and exposed to helicopter traffic for eight months. The panels were joined in the field by a series of adhesive lap joints. Results of the tests indicated that the panels provided a dustproof and waterproof surface for the soil subgrade while subjected to helicopter traffic. Both sewn and adhesive joints held satisfactorily throughout the testing. Locked-wheel turns and braking action of helicopter wheels scuffed the surfacing but produced no failures. The membrane was adequate for preventing dust clouds during operations of most conventional Army helicopters. Membrane panels were placed at a rate of 1126 sq ft per man-hour. It is recommended that tests be conducted on membrane surfacing that is stronger than the Tl, that the surfacing be prejoined at the factory as a complete unit capable of being transported by fixed-wing and rotary-wing aircraft, and that some medium other than adhesive be used for joining the panels. (Author)

AD-622 152 Div. 33/1 ,1/4
CFSTI Prices: HC $2.00 MF $0.50
NAVAL WEAPONS EVALUATION FACILITY ALBUQUERQUE N MEX
THE CIRCULAR RUNWAY.
Jun 65, 42p.

Unclassified report

Descriptors: (*Runways, Curved profiles), (*Aeronautics, Runways), Landing fields, Aircraft landings, Take-off, Feasibility studies, Flight testing, Naval aviation

This report has been compiled to inform interested persons of the current status and thinking associated with the circular aircraft runway concept. It is a new concept and an exciting one to contemplate. Perhaps it will never come into being, but regardless, the authors hope that this pamphlet will stimulate further thought on the subject, both pro and con. Admittedly the report has been written with a positive approach to the subject. Essentially, we feel the idea has definite merit and deserves further investigation by any person or organization which might profit by its application.

AD-621 634 See Fld. 20/1

2/5. ANIMAL HUSBANDRY

AD-621 780 Div. 16/14,16/10
BAYLOR UNIV HOUSTON TEX COLL OF MEDICINE
EFFECT OF BLOOD VOLUME ON MOVEMENT OF PROTEIN AND VOLUME DISTRIBUTION OF ALBUMIN IN THE DOG,
by E. L. Smith, R. A. Huggins, and S. Deavers.
18 Sep 64, 9p. Contract DA49 193MD2357
Grant ,PHS HE06983 02

Unclassified report

Pub. in American Journal of Veterinary Research v26 n113 p829-36 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Blood volume, Blood proteins), (*Serum albumin, Blood volume), Blood pressure, Globulins, Blood transfusions, Blood circulation, Hemorrhage, Lympth, Dogs

Some acute compensatory responses were measured following reduction and expansion of the blood volume in anesthetized dogs. In dogs bled to a mean arterial pressure of 50 mm.Hg, 7.5 ml./kg. of fluid and 0.21 Gm/kg. of protein were replaced. There was agreement between the dilution of the specific activity (count/min./Gm.) of protein (16%) and albumin (11%) and the amount of protein gained (15 and 8%) from extravascular sources. Globulin constituted 76% of entering protein. In overtransfused (50 ml./kg.) dogs, fluid (26.9 ml./kg.) and protein (1.26 Gm./ kg.) escaped from the circulation; globulin constituted 60% of protein leaving. Escaped protein had the same specific activity as circulating protein. The count/min./ Gm. of albumin of plasma and lymph reached equilibrium within 10 to 40 minutes after transfusion, whereas their equilibrium was not reached in the bled or control dogs during during a 4-hour period. Thoracic duct lymph flow increased transiently during hemorrhage. During the following overtransfusion, rates of lymph flow and lymph protein concentration increased significantly, both remaining above control levels for the next 70 minutes. In one dog in which equilibrium was reached, volume distribution of extravascular albumin was 40.4 ml./kg. before and 67.8 ml./kg. after transfusion. (Author)

AD-622 210 See Fld. 6/3

3/1. ASTRONOMY

AD-621 653 Div. 2/1 ,20/2
CALIFORNIA INST OF TECH PASADENA
ORIGIN OF COSMIC X RAYS,
by F. Hoyle. 30 Jun 65, 2p. Contract Nonr22047, NGR05 002 028

Unclassified report

Pub. in Physical Review Letters v15 n4 p131-2 26 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Research performed in cooperation with Cambridge Univ. (England).

Descriptors: (*Cosmic rays, X rays), (*X rays, Cosmic rays), (*Astrophysics, Cosmic rays), Extraterrestrial radio waves, Gamma rays, Compton scattering, Galaxies, Nuclear physics

AD-621 655 Div. 2/1
CALIFORNIA UNIV LOS ANGELES DEPT OF ASTRONOMY
REDISCUSSION OF ECLIPSING BINARIES. VII. WZ OPHIUCHI AND OTHER SOLAR-TYPE STARS,
by Daniel M. Popper. 5 Aug 64, 21p. Contract Nonr350700

Unclassified report

Pub. in Astrophysical Journal v141 p126-44 Jan 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Binary stars, Stellar eclipses), Astrophysics, Spectroscopy, Variable stars, Velocity, Luminescence, Doppler effect

The investigation of eclipsing binaries for which the most reliable masses and radii can be obtained is continued with analysis of the systems WZ Oph, F8, VZ Hya, F5, and UV Leo, G2. New spectrographic orbits were determined for all three systems, and a photoelectric light-curve was obtained for WZ Oph. The use of increased spectrographic dispersion leads to systematically smaller masses for WZ Oph (23 per cent smaller) and UV Leo (27 per cent smaller) than previously published. The properties of the components are listed. All the stars have appreciable ultraviolet excesses (relative to the Hyades), 0.04m-0.08m, and all lie close to the 'Sun-Sirius' relation in the mass-luminosity plane, in agreement with a result by Eggen that this relation is populated only by stars with ultraviolet excesses. A brief discussion is given of some problems of analysis resulting from the exceptionally high precision required in the linear dimen-

sions of the orbits of visual as well as eclipsing binaries if significant conclusions are to be reached on the 'fine structure' of the mass-luminosity diagram. (Author)

AD-621 723 Div. 2/1 ,25/5
PALMER PHYSICAL LAB PRINCETON UNIV N J
COSMIC BLACK-BODY RADIATION.
Technical rept.,
by R. H. Dicke, P. J. E. Peebles, P. G. Roll, and D. T. Wilkinson. 7 May 65, 8p. Contract Nonr185830 Proj. NR019 627

Unclassified report

Pub. in The Astrophysical Journal v142 n1 p414-9 Jul 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Blackbody radiation, Cosmic rays), (*Field theory, Relativity theory), Gravity, Interstellar matter, Thermodynamics, Galaxies

The problems of the singularity characteristic of the cosmological solutions of Einsteins's field equations, and the excess of matter over antimatter in the universe are discussed.

AD-621 786 Div. 2/1
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB
HYDROMAGNETIC EQUILIBRIUM AND TOROIDAL (RING) CURRENT SYSTEMS.
Physical science research papers, (revised ed.),
by Marvin L. White. 3 Dec 64, 21p. Rept. no. PSRP-133 ,AFCRL-65-663
Proj. 8635 Task 863502

Unclassified report

Pub. in The Journal of Geophysical Research v70 n9 p2159-70 May 1 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 21 Sep 64.

Descriptors: (*Magnetohydrodynamics, Astrophysics), (*Astrophysics, Magnetohydrodynamics), Solar corona, Magnetic fields, Ionosphere, Ionic current, Density

A self-consistent steady-state treatment is given for the interaction of an inexorable radial source of completely ionized hydrogen with a poloidal magnetic field. When the particles are directed radially outward (inward) the magnetic lines of force are weakened (strengthened) with increasing particle emission (injection). The poloidal magnetic field is generally expressible in terms of the undistrubed component (solutions of Laplace's equation) times a MHD distortion factor given by the confluent hypergeometric functions. Expressions are given for the toroidal current and current density associated with the distorted field and for the particle flux required to maximize the total toroidal current. Coronal azimuthal (ring) current densities comparable to ionospheric current densities are predicted. (Author)

AD-621 828 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
NUFFIELD RADIO ASTRONOMY LABS UNIV OF MANCHESTER MACCLESFIELD (ENGLAND)
THE DETERMINATION OF THE ACCURATE POSITIONS OF RADIO STARS BY THE LUNAR OCCULTATION TECHNIQUE; AND OBSERVATIONS OF GALACTIC ABD EXTRA-GALACTIC EMISSION AT 408 MC/S.
Progress rept. no. 2, Jan-Mar 65,
by Conrad H. Slater, C. G. T. Haslam, and M. J. S. Quigley. Mar 65, 7p. Contract N62558 3928

Unclassified report

Descriptors: (*Radio astronomy, Ultrahigh frequency), (*Stars, Position finding), (*Galaxies, Radio astronomy), Astrophysics, Photography, Optical properties

AD-621 829 Div. 2/1
MCDONALD OBSERVATORY UNIV OF TEXAS AUSTIN
THE LUMINOSITY CLASSIFICATION OF GALAXIES AND SOME APPLICATIONS.
Technical rept.,
by G. De Vaucouleurs. 5 Aug 64, 9p. Rept. no. TR-4
Contract Nonr37513 Proj. NR046 785

Unclassified report

Pub. in Astronomical Journal v69 n9 p737-43 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Galaxies, Brightness), Classification, Statistical tests, Doppler effect, Velocity

The Van den Bergh luminosity classification for spiral galaxies was statistically tested for possible systematic effects depending on declination and galactic latitude; no significant correlation can be detected other than a slight excess of high-luminosity systems in low galactic latitudes probably due to selection effects in the Shapley-Ames Catalogue. The calibration of luminosity classes in terms of absolute magnitude was derived from residuals in the velocity-magnitude relation using improved magnitudes in the B system corrected for galactic absorption (mc) and an enlarged list of redshifts (V-o). If L = 1, 2, 3, ..., 9 for DDO classes I, I-II, II, ..., V, then a least-squares fit through the relation, log V-o = const + 0.2 (l+mu)m-c-0.1 (l+lambda)L, gives Mu=0.048=0.047 (m.e.) and lambda =0.029=0.050 (8<m-c<14; n=213 galaxies), i.e., a negligible correction to the previously assumed slope delta-M/deltaL=0.50 and in the mean (over a large area of the sky) a negligible departure from the theoretical slope of the V (m) relation. Van den Bergh's data can be used to check Van Albada's suggestion that the anistropy of the velocitymagnitude relation for nearby galaxies is due to systematic variations with direction of the mean absolute magnitude of galaxies having a given type and magnitude. The tests give little support to this hypothesis and systematic departures in the V (m) relations in different parts of the sky remain even when allowance is made for luminosity effects. (Author)

AD-621 854 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
THE LATITUDE BOUNDARIES OF JUPITER'S BANDS,
by M. V. Stovas. Aug 65, 8p. Rept. no. T-439-R TT , 65-64064

Unclassified report

Trans. of Mezhdunarodnyi Geofichicheskii God, Kiev, Informatsionnyi Byulleten' (USSR) n3 p65-70 1961.

Descriptors: (*Jupiter, Optical phenomena), (*Planetary atmospheres, Jupiter), Extraterrestrial topography, Celestial mechanics, Potential theory, Astrophysics, USSR

The latitudinal bands of Jupiter are discussed as phenomena reflecting, in Jupiter's atmosphere, the particular 'tectonics' of the planet. Physical relationships are established connecting the latitudes of the bands, the active formations, and the critical parallels --- a relationship which can only arise in the solid core of the planet through variation of the potential of deforming forces. The author comes to the conclusion that a 'volcanism' is, perhaps, produced by changes in the rotational regime of the planet. (Author)

AD-622 083 Div. 2/1 ,25/7
LIEGE UNIV (BELGIUM) DEPT OF ASTROPHYSICS
THE LYMAN LINES IN THE SPECTRUM OF MAIN SEQUENCE EARLY-TYPE STARS.
Technical note,
by L. Houziaux. 15 Jul 65, 31p. Rept. no. TN-8
Contract AF61 052 587
AFCRL , 65-685

Unclassified report

For DDC reference use only.

Descriptors: (*Astrophysics, Stars), (*Stars, Ultraviolet spectroscopy), (*Ultraviolet spectroscopy, Stars), Binary stars, Hydrogen, Line spectrum, Continuous spectrum, Absorption spectrum, Atmosphere models

Profiles of Lyman lines have been computed for five model atmospheres representing main-sequence B-type stars. Interstellar lines have also been considered. (Author)

AD-622 105 Div. 2/1
ASTROPHYSICAL OBSERVATORY SMITHSONIAN INSTITUTION CAMBRIDGE MASS
THE TEMPERATURE STRUCTURE OF EARLY-TYPE MODEL STELLAR ATMOSPHERES. II. A GRID OF STELLAR MODELS,
by S. E. Strom, and E. H. Avrett. 25 Sep 64, 98p.

Unclassified report

Prepared in cooperation with Harvard Coll. Observatory, Cambridge, Mass. Pub. in The Astrophysical Journal, Suppl series supl n103 v12 p1-98 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Atmosphere models, Stars), (*Stars, Atmosphere models), (*Astrophysics, Stars), Temperature, Optics, Hydrogen, Helium, Atomic spectroscopy, Astronomical data, Tables

The essential numerical data are presented for a grid of accurate non-gray stellar models, covering the range 10000K < T sub eff < 20000K and log g = 3 and 4. Details of the calculational procedures used in computing this grid are discussed. Included as sources of continuous opacity are H, H (-), H sub 2 (+), He i, He ii, electron, and Rayleigh scattering. In all cases, constancy of the flux and flux derivative is preserved to better than 0.2 per cent. Some of our models overlap, and are in good agreement, with those recently published by Mihalas. (Author)

AD-622 243 Div. 2/1
CFSTI Prices: HC $4.00 MF $1.00
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
PROBLEMS OF CELESTIAL MECHANICS: COMPREHENSIVE REPORT.
ATD Work Assignment no. 8.
23 Jul 64, 146p. Rept. no. ATD-U-64-78
TT , 65-64131

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Celestial mechanics, USSR), (*Astrophysics, Celestial mechanics), N-body problem, Perturbation theory, Differential equations, Numerical analysis, Bibliographies

This report reviews Soviet open-source literature on the problems of celestial mechanics. Topics include: Introduction to problems of motion of celestial bodies; the n-body problem and perturbations of motion; analytical expansion of the pertur-

bation function into series; differential equations for perturbations and their solutions; and variations of elements and solutions of the differential equations. A bibliography is also included.

AD-622 244 Div. 2/1
CFSTI Prices: HC $6.00 MF $1.25
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
GASEOUS NEBULAE AND GALAXIES: COMPREHENSIVE REPORT.
ATD Work Assignment no. 35, Task 20.
5 Aug 64, 246p. Rept. no. ATD-U-64-87 TT , 65-64132

Unclassified report

Rept. on Surveys of Soviet-Bloc Scientific and Technical Literature. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Galaxies, Physical properties), (*Nebulae, Physical properties), (*Astronomy, USSR), Chemical analysis, Dust, Sodium, Clouds, Stars, Novae, Reviews

The report is divided into four parts. In Part I the following subjects are considered: the chemical composition of gaseous nebulae and dark clouds in interstellar space; dusty clouds and their absorption ability; the dynamical physical properties and processes in nebulae, as investigated by spectroscopic and photometric methods; distances to the gaseous nebulae; gaseous nebulae of the type known cometary nebulae; and the artificial sodium cloud. Part II is concerned with studies of various kinds of hot stars. The areas covered include: configuration equilibrium; studies of stellar atmospheres; physical properties of stars, including spectral analysis and polarization; novae and the causes of their formation; and young supergiant stars and the physical processes within these stars. Part III is devoted to galaxies. Interstellar matter, including the gas motion in the Galaxy and the magnetic field and the structure and dynamics of galaxies and the Metagalaxy clusters are considered. Part IV contains reviews of Soviet works on gaseous nebulae, hot stars, and galaxies. The books reviewed are used as textbooks for advanced students and specialists.

AD-621 943 See Fld. 20/3

AD-622 241 See Fld. 8/7

4/2. METEOROLOGY

AD-621 650 Div. 2/7 ,25/4
CFSTI Prices: HC $2.00 MF $0.50
INTERMOUNTAIN WEATHER INC SALT LAKE CITY UTAH
THE INFLUENCE OF HAZE UPON LONG WAVE RADIATON.
Interim rept. no. 2, 1 Dec 64-21 May 65,
by Wilford Zdunkowski, Donald Henderson, and J. Vern Hales. Jul 65, 49p. Contract DA28 043AMC00122E Proj. DA 1V0 14501B53A04 05

Unclassified report

Descriptors: (*Atmospheric temperature, Infrared radiation), (*Infrared radiation, Atmospheric temperature), (*Haze, Atmospheric temperature), Turbulence, Heat transfer, Atmosphere, Lapse rate, Heat transfer coefficients, Graphics

Temperature changes due to the combined effects of radiation and turbulence were computed using the ideas of Interim Report No. 1 ('The Effect of Atmospheric Haze on Infrared Radiative Cooling Rates', W. Zdunkowski, D. Henderson, and J. Vern Hales.) It was found that the results correspond with the general idea that radiation effects should not be neglected. The numerical results are not yet satisfactory and further experimentation is necessary. An error was discovered in Interim Report No. 1 for the computations including reflected radiation. The revision is included as an appendix to this report. (Author)

AD-621 658 Div. 2/7
CFSTI Prices: HC $5.00 MF $1.00
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
PROJECT SAND STORM, AN EXPERIMENTAL PROGRAM IN ATMOSPHERIC DIFFUSION.
Environmental research papers,
by John H. Taylor. Sep 65, 189p. Rept. no. AFCRL-65-649 ,ERP-134
Proj. 3850 Task 385001

Unclassified report

Descriptors: (*Diffusion, Atmosphere), (*Atmosphere, Transport properties), Experimental data, Atmospheric motion, Meteorological instruments, Meteorological parameters

A series of field experiments in atmospheric diffusion was conducted at Edwards Air Force Base, California, in 1963. The primary feature which distinguished this series from similar experimental investigations was that instantaneous sources were studied. Puffs of tracer material were generated quasi-instantaneously by short bursts of small, horizontally fired, solid propellant rocket motors. Tracer samples were collected on a horizontal grid that had 350 sampling positions. All of the 43 experiments were conducted under thermally unstable atmospheric conditions. Analyses of the data identified the region of the turbulent energy spectrum which contains the eddies that are effective in diffusing the clouds. Eulerian measurements of turbulence are shown to be correlated with lateral rates of cloud growth. Downwind distributions of peak inhalation-level dosages were found to be quite irregular, with the anomalies unpredictable on the basis of measurable meteorological parameters. It was, nevertheless, possible to develop an operationally useful estimating equation relating peak dosages to distance from the source. (Author)

AD-621 694 Div. 2/7 ,25/4
CFSTI Prices: HC $4.00 MF $0.75
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SEARCHLIGHT BEAM IN THE ATMOSPHERE; INVESTIGATIONS IN ATMOSPHERIC OPTICS,
by G. V. Rozenberg. 28 Aug 62, 122p. Rept. no. AID-62-126
TT , 62-33093

Unclassified report

Partial trans. of mono. Prozhektornyi Luch v Atmosfere; Issledovaniya po Atmosfernoi Optike, Moscow 1960 243p.

Descriptors: (*Optics, Atmosphere), (*Atmospheric sounding, Searchlights), (*Searchlights, Atmospheric sounding), (*Atmosphere, Optical properties), Light transmission, Scattering, Aerosols, USSR

AD-621 728 Div. 2/7 ,30/5
CFSTI Prices: HC $2.00 MF $0.50
TEXAS A AND M UNIV COLLEGE STATION DEPT OF OCEANOGRAPHY AND METEOROLOGY
A STUDY TO IMPROVE THE LOW-LEVEL METEOROLOGICAL SIMULATOR.
Quarterly rept. no. 2, 1 Apr-30 Jun 65,
by William H. Clayton. Jun 65, 28p. Rept. no. 10 ,Reference 65-20T
Contract DA36 039AMC02195E Proj. 1V014501B53A04 04,346

Unclassified report

Descriptors: (*Simulation, Meteorology), (*Meteorology, Simulation), Meteorological instrumentation, Low altitude, Analog computers, Model tests, Fog, Jets, Wind, Measurements, Data processing systems

The purpose of this study is to improve the model utilized in the Low-Level Meteorological Simulator previously developed and to investigate extension of this model, particularly with regard to inclusion of fog and low level jet phenomena. The contractual efforts have for the most part consisted of modification and maintenance efforts on the GPAC in preparation for Section V evaluation of the selected meteorological cases. (Author)

AD-621 753 Div. 2/7 ,30/3
CFSTI Prices: HC $1.00 MF $0.50
CONTROL EQUIPMENT CORP NEEDHAM HEIGHTS MASS
STUDY OF THE CHEMISTRY OF THE EARTH'S UPPER ATMOSPHERE.
Final rept. for 1 Jun 64-31 May 65,
by Harry E. Adams. Jun 65, 17p. Contract AF19628 4201 Proj. 4691, 6687 Task 469102, 668701
AFCRL, 65-576

Unclassified report

Descriptors: (*Upper atmosphere, Chemistry), (*Atmospheric sounding, Instrumentation), Sounding rockets, Scientific satellites, Density, Barometric pressure, Atmospheric temperature, Gas ionization, Reaction kinetics, Mass spectrum, Spectrum analyzers

A summary is given of work involving the study of the chemistry of the upper atmosphere and the kinetics of atmospheric gases. The work included design, construction, test and installation of instrumentation in rocket and satellite payloads and in laboratory devices; the performance of field and laboratory studies; and the evaluation of experiment results. The work was divided into three separate programs as follows: (1) Studies of the density, pressure, and temperature of the earth's upper atmosphere; (2) Studies of the composition of the earth's upper atmosphere; (3) Studies of the reaction rates of neutral and ionized species.

AD-621 823 Div. 2/7
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
ON THE ATTENUATION OF SOLAR RADIATION IN THE UPPER LAYERS OF THE TROPOSPHERE (OB OSLABLENII SOLNECHNOI RADIATSII V VERKHNIKH SLOYAKH TROPOSFERY),
by Yu. I. Rabinovich. 20 May 63, 6p. Rept. no. AID-T-63-75
TT , 63-19694

Unclassified report

Trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad, Trudy (USSR) n125 p54-7 1962.

Descriptors: (*Solar radiation, Attenuation), (*Troposphere, Solar radiation), (*Aerosols, Troposphere), Optical properties, Measurement, Optics, Geophysics, USSR

The aerosol attenuation coefficient of direct radiation at an altitude of 3-5 km is practically equal to zero. At the same time, the aerosol optical thickness of the atmosphere above 6 km (tau sub 6 approaches infinity) attains a considerable magnitude. This article presents experimental values of tau sub 6 approaches infinity and discusses their dependence on wavelength and the atmospheric conditions. (Author)

AD-621 866 Div. 2/7
CFSTI Prices: HC $2.00 MF $0.50
COLORADO STATE UNIV FORT COLLINS DEPT OF ATMOSPHERIC SCIENCE
CUMULUS CONVECTION AND OROGRAPHIC CONVECTION CELLS.
Final rept. for 1 Dec 64-31 May 65,
by Herbert Riehl. 31 May 65, 47p. Contract DA36 039SC89080 Proj. 3A99 27 005 09

Unclassified report

Descriptors: (*Cyclones, Southeast Asia), (*Meteorology, Southeast Asia), Air mass analysis, Rainfall, Correlation techniques, Convection, Thermodynamics, Meteorological charts, Tropical regions

The general goal of this research is to investigate various aspects of the monsoon circulation over Southeast Asia. Particularly, to examine such features as, the time onset of monsoon and its variability within the season, correlation of the synoptic and meso-structure of cloud systems as revealed over land by satellite and conventional data, and investigate the synoptic time sequence of the winds during the monsoon season, locate principal bad weather areas and their frequency and succession. (Author)

AD-621 886 Div. 2/7
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
POLISH METEOROLOGY.
Bibliography for 1955-1961.
10 Jan 62, 39p. Rept. no. AID-62-3
TT , 63-19732
Unclassified report

Descriptors: (*Meteorology, Poland), Bibliographies, Scientific organizations, Weather stations, Weather forecasting, Aeronautics, Scientific personnel, Training, Abstracting, Meteorological instruments

This is a preliminary annotated bibliography on the meteorological service of Poland. Polish source materials in the form of monographs, periodicals and newspapers from 1955 to 1961 inclusive have been covered, though a few items published prior to 1955 but considered exceptionally pertinent to the subject matter have also been included. The primary emphasis in compilation has been placed on the following aspects of the meteorological service: (a) meteorological organizations in the country; (b) weather observing facilities, expecially those at airports; (c) weather forecasting facilities; (d) inflight facilities for aircraft; and (e) competence and training of personnel. The entries are arranged alphabetically by author within each of the eight subject headings. Titles of Polish monographs are given in the original language and followed by a translation. Titles of articles in periodicals and newspapers are given in English only. Library of Congress call numbers are provided for all entries from sources cataloged and available in the collections of the Library of Congress. (Author)

AD-621 908 Div. 2/7 ,8/6 ,15/2
CFSTI Prices: HC $3.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
LEAST SQUARES REDUCTION OF BOTTOMSIDE IONOGRAMS.
Scientific rept.,
by J. M. Grebowsky. 15 Aug 65, 71p. Rept. no. SR-246
Contract AF19 628 4014 Grant ,NSF GP2914
Proj. 8605 Task 860502
AFCRL , 65-669
Unclassified report

Descriptors: (*Least squares method, Electron density), (*Electron density, Distribution), (*Ionosphere, Electron density), Ionospheric propagation, Plasma physics

Techniques are presented by which the distribution of electrons in the bottomside ionosphere can be determined using bottomside ionograms. These methods are based upon a least squares solution of the virtual height equations. Using an iterative minimization scheme, the electron density profile can be approximated by a given functional form. For this type of analysis ordinary and/or extraordinary mode data are used. Similarly, if the retardation due to the lower portion of a layer is known, the same minimization scheme can be used to approximate the nose of a layer by a parabola using virtual heights sampled near the peak plasma frequency. For the situation in which the virtual heights are not observed below a certain plasma frequency, the group refractive index is approximated by a Chebyshev polynomial expansion in the unseen region. Such an approximation simplifies the virtual height equation and enables one to invert the equation numerically. In this manner accurate true height profiles can be obtained without assuming a given functional form for the electron density distribution in the cutoff region. When a valley is present between two layers of the ionosphere, the ionogram may be reduced by treating it as a 'low frequency cutoff' problem where the critical frequency of the lowest maximum of electron density is considered to be the 'cutoff' frequency. (Author)

AD-621 924 Div. 2/7
CFSTI Prices: HC $3.00 MF $0.75
UNITED AIRCRAFT CORP EAST HARTFORD CONN
CIRCULATION-CLOUD PROGNOSTIC RELATIONSHIPS: SUMMER AND FALL.
Final rept. for 1 Oct 64-31 Jul 65,
by Donald A. Chisholm, and Gordon B. Lassow.
Sep 65, 81p. Contract AF19 628 3437 Proj. 1.0
ESD , TR-65-14
Unclassified report

Subcontracted to Travelers Research Center, Inc., Hartford, Conn. Rept. no. 7463-177.

Descriptors: (*Cloud cover, Mathematical prediction), (*Weather forecasting, Statistical analysis), Atmospheric motion, Moisture, Clouds, Correlation techniques, Meteorology

Regression Estimation of Event Probabilities (REEP) equations were derived from summer and fall data samples to diagnose cloud amounts from circulation and moisture prognoses. Equations were derived for total-, low-, middle-, and high-cloud amounts, and for the time change of total-cloud amount. Sets of equations were derived for 12-, 24-, 36-, and 48-hr forecast intervals. In deriving the equations, persistence and moisture content were found to be the most significant predictors. Of lesser significance were temperature and circulation features (500-mb height, thickness, and vertical velocity). When tested on independent data, the REEP equations gave better results than persistence for each cloud amount category and for each forecast interval . (Author)

AD-621 935 Div. 2/7
CFSTI Prices: HC $4.00 MF $1.00
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
THE DYNAMICS OF CUMULUS CONVECTION IN THE TRADES-A COMBINED OBSERVATIONAL AND THEORETICAL STUDY.
Technical rept. (Doctoral thesis),
by Joseph Levine. 2 Jul 65, 138p. Rept. no. reference 65-43
Contract Nonr219600 Grant ,NSF GP1451
Unclassified report

Descriptors: (*Cumulus clouds, Convection), Clouds, Liquids, Water, Measurement, Airborne, Meteorological instruments, Experimental data, Theory, Models (Simulations)

The development and calibration of an aircraft instrument for measuring cloud liquid water and volume median drop diameter is described. A hot-wire loop is sensitive to drops smaller than 100 microns. A wire wound around a ceramic cone is sensitive to larger drops. A comparative study of the 'bubble' with the 'steady state jet' model is made and related to tank experiments. A relation of mixing parameters to eddy coefficients is demonstrated. The 'bubble' model is extended to cumulus convection. Formulae for the behavior of average 'bubble' potential temperature, liquid water, and vertical velocity as a function of height are derived. The effects of drop growth by condensation and coalescence and of precipitation are lumped together. A study of cumulus cloud observations is made to compare model computations with observations. Emphasis is placed on the usefulness of the model in parameterizing the statistical properties of clouds. (Author)

AD-621 940 Div. 2/7
CFSTI Prices: HC $3.00 MF $0.75
UNITED AIRCRAFT CORP EAST HARTFORD CONN
A TECHNIQUE FOR ANALYSIS AT 10MB.
Final technical rept. for 1 Jan-31 Jul 65,
by Abraham M. Pavlowitz, and Bernard J. Erickson. Sep 65, 76p. Contract AF19 628 3437
Proj. 2.0 Task 2.1
ESD , TR-65-12
Unclassified report

Subcontracted to Travelers Research Center, Inc., Hartford, Conn., TRC-7463-175.

Descriptors: (*Weather forecasting, Numerical methods and procedures), Stratosphere, Meteorological parameters, Mathematical prediction, Statistical analysis, Meteorological charts, Northern Hemisphere

Two sets of vertical extrapolation equations were derived to specify initial-guess fields of 10-mb heights and temperatures using a five-year data sample. Both past (t sub - 24) and present (t sub 0) data were considered as specifiers in the first set of equations. Only present (t sub 0) data were used as specifiers in the second set of equations. Both sets of equations showed stability when tested on independent data. Further, verification statistics showed that the results from the independent data were similar to those from the dependent data. Both sets of equations were then compared by incorporating them into a modified successive approximation technique to produce initial-guess fields. These initial-guess fields were similar. An experiment comparing the two sets of equations with equations derived by the U. S. Weather Bureau showed that the TRC equations gave lower specification errors. This technical report includes (or supersedes) information previously published under TM 11-7459-138. (Author)

AD-622 024 Div. 2/7
CFSTI Prices: HC $4.00 MF $1.00
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
NATIONAL WEATHER SERVICE, USSR; COLLECTION OF REPORTS.
Rept. no. 1 on AID Work Assignment no. 32.
1965, 145p. Rept. no. AID-62-3a
TT , 65-64091
Unclassified report

Consists of reviews of articles published in Russian periodicals and newspapers. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Weather forecasting, USSR), (*Atmospheric sounding, USSR), Bibliographies, Meteorology, Armed forces (Foreign), Scientific organizations, Climatology, All-weather aviation, Meteorological satellites, Sounding rockets, Weather stations, Polar regions, Atmosphere, Optical properties, Artificial precipitation, Reviews

Contents: Relationship of the national weather service to the military weather service; Structure of the agencies providing weather service to the Soviet armed forces; Organization of the agency providing weather service to the Soviet army; Forty years of the Soviet Hydrometeorological Service; Correct evaluation of meteorological conditions; Cooperation between civil and military; Methods of compiling 3-7-day weather forecasts; Present state of Soviet climatology; Automation of meteorological work; Air weather service; Gas composition of the earth's atmosphere; Arrangement of the meteorological network; Conference on transparency and visibility; Evaluation of conditions for high-altitude flight; Rockets and satel-

lites and the investigation of the upper atmosphere; Kotel'nikov theorem and the study of geophysical phenomena; Popularization of hydrometeorological knowledge; Satellites and atmospheric optical research; Aerological and polar drifting stations; and Weather control: Conference on weather modification, Artificial activation of clouds and fog.

AD-622 073 Div. 2/3 ,2/5
CFSTI Prices: HC $3.00 MF $0.75
DARTMOUTH COLL HANOVER N H
RAINFALL IN BURMA,
by Robert E. Huke. 1965, 100p. Rept. no. geography pub-2
Contract DA19 129QM1966

Unclassified report

Descriptors: (*Rainfall, Burma), (*Climatology, Burma), Geography, Meteorology, Hydrology, Maps

AD-622 092 Div. 2/7 ,2/3
MIAMI UNIV CORAL GABLES FLA INST OF MARINE SCIENCE
MESOSCALE STUDIES OF INSTABILITY PATTERNS AND WINDS IN THE TROPICS.
Rept. no. 8 (Final), 1 May 62-31 May 65,
by Harold P. Gerrish, and Homer W. Hiser. Jun 65, 129p. Rept. no. 8226-8 ,ML-65264
Contract DA36 039sc89111 Proj. DA 1V014501B53A09

Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Meteorology, Tropical regions), (*Weather forecasting, Meteorological radar), (*Meteorological radar, Weather forecasting), (*Climatology, Tropical regions), Florida, Rainfall, Wind, Jet streams (Meteorology), Sea breeze

This report is a summary of three years of work. Part I is primarily synoptic with sections on mesoscale analysis in South Florida, rainfall climatology of South Florida and the sea breeze, climatology of rare weather phenomena in South Florida, preliminary models of the lowlevel atmosphere during periods of rare weather events, triggering mechanisms, and mesoscale weather patterns in the low-level easterlies. Part II pertains mostly to radar with sections on radar in a tropical environment, estimation of rainfall at the ground using photo-integration techniques, CAPPI in the tropics, motion of individual tropical showers, echo motion shear within individual tropical showers, and vertical profiles of reflectivity in individual tropical showers. Locations of 157 rain gages and 41 anemometers in South Florida are presented. Nomograms are developed to relate theoretical radar reflectivities, rainfall rates, and equivalent rainfall rates from aggregate snow with radar power received. Nomograms are also presented for radar propagation in the mean summer tropical atmosphere. (Author)

AD-622 119 Div. 2/7 ,5/2
CFSTI Prices: HC $3.00 MF $0.75
TECHNOLOGY INC DAYTON OHIO
MEASUREMENT OF WIND SHEAR.
Rept. no. 4 (Final), 1 Jul 62-1 Sep 64,
by N. S. Phillips, R. L. Jeffries, and M. C. Eifert. 1 Sep 64, 96p. Contract DA36 039sc90854
Proj. DA1VO14501B53A11

Unclassified report

Descriptors: (*Wind, Measurement), (*Meteorological instruments, Free fall models), (*Telemeter systems, Atmospheric sounding), (*Atmospheric sounding, Telemeter systems), Airborne, Anemometers, Aerodynamic configurations, Data transmission systems, Digital systems, Magnetic recording systems, Environmental tests, Wind tunnel models

The latest wind shear measurement system consists of a revised probe configuration and a ground station capable of transcribing telemetered data in digital form onto magnetic tape. The external configuration of the probe was modified by adding a convergent ring wing and canard surfaces to the design developed under Contract DA 36-039 SC-75064. These modifications were necessary to provide the drag and proper stability required for a 'tuned' probe capable of carrying the volume and weight of the selected sensors. The instrumentation package was designed to accommodate commercially available accelerometers, an aspect sensor, and pressure transducers. The probe with the external modifications was tested satisfactorily by two wind tunnel programs conducted at the Air Force Institute of Technology. The ground system consists of an Ampex FR 300 digital tape transport, a GMD-1 Rawin standard receiver, an encoder, and a readout matrix. Data telemetered from the probe is received, encoded, and transcribed onto magnetic tape at a density of 200 characters per inch. The parameters recorded are dynamic and static pressure, horizontal accelerations, and azimuth. These are written in a format compatible with IBM computers and specifically designed for Fortran computation. Field tests were conducted at NASA Wallops Island Station. These verified the feasibility of the wind shear probe concept and provided numerous data in a form suitable for thorough investigation. During the tests the ground station performed as designed; however, instrumentation and launch problems prevented a completely successful program. (Author)

AD-622 213 Div. 2/7 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
DETERMINATIONS OF SKY BRIGHTNESSES (A) TABLE OF SKY BRIGHTNESS MEASUREMENTS,
by W. S. Verplanck. 9 Aug 44, 3p. Rept. no. MRL-44

Unclassified report

Descriptors: (*Sky brightness, Tables), Marine geophysics, Oceans, Atmosphere, Optical properties

Determinations of sky brightness were made on two moonless nights. These measurements were made at least two and one half hours after sunset, and at least two before moonrise. Distance from land was not less than 300 miles.

AD-622 233 Div. 2/7 ,13/4
CFSTI Prices: HC $4.00 MF $1.00
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
THE SOVIET 300-METER METEOROLOGICAL TOWER.
Special rept.
12 Feb 64, 133p. Rept. no. AID-U-64-6
TT , 65-64122

Unclassified report

Review of Soviet open-source material pub. 1960-63. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Weather stations, Towers), (*Towers, Weather stations), (*Meteorological instruments, Towers), Weather forecasting, Meteorological parameters, Measurement, Scientific organizations, USSR

Information presented herein has been extracted from open-source materials published in the Soviet Union between 1960 and 1963. Most of the scientific data reported in these sources represent observational data obtained at least one year, and, in some instances, as many as four years, prior to the date of publication. The report consists of two parts. Part A contains a brief, summarized description of (1) the 300-meter tower installation complex (physical plant); (2) the tower's organizational relationship to the USSR Academy of Sciences; (3) a list of scientific personnel known to be associated with the research programs at the tower; and (4) abbreviated statements of the research purposes envisaged for all tower installations in the Soviet Union as well as those envisaged for the 300-meter tower.

AD-622 236 Div. 2/7 ,13/4
CFSTI Prices: HC $6.00 MF $1.25
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
THE SOVIET 300-METER METEOROLOGICAL TOWER.
Rept. no. 2 on AID Work Assignment no. 50 E.
25 Mar 64, 232p. Rept. no. AID-U-64-20
TT , 65-64124

Unclassified report

Trans. of mono. Izuchenie Pogranichnogo Sloya Atmosphery s 300-Metrovoi Meterologicheskoi Bashni, Moscow, 1963, p41-159. See also AD-622 233. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Weather stations, Towers), (*Towers, Weather stations), (*Meteorological instruments, Towers), Weather forecasting, Meteorological parameters, Aerosols, Scientific organizations, USSR

Contents: Principal problems arising in the organization of observations on the meteorological tower; Results of meteorological observations on the high tower; Indirect evaluation of temperature advection and the mixing coefficient from smoothed temperature observations made from a tower; Analysis of an experimental series of measurements of the heat and radiation balance; Certain characteristics of the turbulence of the wind field in the lower 300-meter layer of the atmosphere; The turbulent diffusion of an aerosol settling from a point source located in the lower layer of the atmosphere; Thermodynamic model of an idealized purely thermal vertical circulation of the atmosphere; The use of thermodynamics for evaluation of the extreme values of kinetic energy dissipation in the atmosphere when a wind is blowing; Experience with studying the wind field around a cylindrical tower with balconies; Reduction of random errors of smoothing data obtained in measurements on meteorological towers; Use of emulsion polymers as artificial aerosols; and A met d of investigation of the distribution of an artificial aerosol in the surface boundary layer.

AD-621 830 **See Fld. 17/9**

AD-621 959 **See Fld. 1/3**

AD-622 223 **See Fld. 20/3**

5/1. ADMINISTRATION AND MANAGEMENT

AD-621 691 Div. 30/1
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
AID LIST OF SCIENTIFIC CONFERENCES THIRD QUARTER 1963,
9 Jul 63, 33p. Rept. no. AID-S-63-94

Unclassified report

Descriptors: (*Symposia, Scientific research), Indexes

The issue lists conferences held during the third quarter of 1963, including symposia, meetings, fairs, and exhibits, of interest to scientists engaged in research and development in the aerospace sciences and technology. Entries in the list are ar-

ranged chronologically, and each entry contains the date, name, and location of the conference, the person or agency to contact for further information, and the sponsoring organ.

AD-621 847 Div. 30/1 ,15/2 ,26/2 ,23/1
CFSTI Prices: HC $2.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
TOWARD A MULTI-STAGE INFORMATION CONVERSION MODEL OF THE RESEARCH AND DEVELOPMENT PROCESS.
Management Science Research rept.,
by Richard G. Brandenburg, and Andrew C. Stedry. Aug 65, 39p. Rept. no. MSRR-48
Contract Nonr76024 Proj. NR047 048
Unclassified report

Descriptors: (*Research program administration, Management engineering), (*Management control systems, Research program administration), (*Management planning, Research program administration), (*Decision theory, Research program administration), Mathematical models, Budgets, Distribution, Operations research, Data processing systems

Research and development activities in a business firm or government laboratory are portrayed as a multi-stage information generation and conversion process. A 'basic research' phase generates opportunities, in the form of findings in a set of scientific disciplines, which are available for subsequent exploitation. It is assumed that increments to information in a subject area are stochastic, proportional to the amount of knowledge which already exists in the area, and have values which are randomly distributed. An 'exploratory development' phase is viewed as a process of selecting a subset of alternative research opportunities, improving each opportunity in the direction of its applications, estimating the value of the improved opportunity and using these estimates to choose the exploratory development results to be implemented in engineering development. The 'engineering development' phase makes the value of exploratory results realizable without changing value or risk. Engineering development costs are assumed to increase as value increases. If exploratory development is not successful, additional costs in engineering development must be incurred to bring the design up to a minimum desirable level. The model is intended as a step toward formulating and analyzing problems in management planning and control of the several interrelated stages of the research and development process. (Author)

AD-621 879 Div. 30/1
CFSTI Prices: HC $8.60 MF $2.25
OFFICE OF AEROSPACE RESEARCH WASHINGTON D C
AIR FORCE RESEARCH RESUMES, 1964. VOLUME 5.
Jun 65, 558p. Rept. no. OAR-65-4
Unclassified report

See also AD-431 950.

Descriptors: (*Air force research, Reviews), Physics, Nuclear physics, Chemistry, Mathematics, Electronics, Materials, Mechanics, Energy conversion, Geophysics, Meterology, Astronomy, Astrophysics, Biology, Medicine, Social sciences, Psychology, Astronautics, Indexes, Abstracting, Subject indexing

Contents: General physics; nuclear physics; chemistry; mathematical sciences; electronics; materials; mechanics; energy conversion; terrestrial sciences; atmospheric sciences; astronomy and astrophysics; biological and medical sciences; behavioral and social sciences; OAR exploratory development.

AD-621 910 Div. 26/2 ,15/2 ,32/4 ,30/2
CFSTI Prices: HC $2.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
DEMON: A MANAGEMENT MODEL FOR MARKETING NEW PRODUCTS.
Management sciences research rept.,
by A. Charnes, W. W. Cooper, J. K. DeVoe, and D. B. Learner. Sep 65, 29p. Rept. no. MSSR-52
Contract Nonr76024 Proj. NR047 048
Unclassified report

Research conducted in cooperation with Northwestern Univ., Evanston, Ill., rept. no. Systems Research Memo. 138, and with Batten, Barton, Durstein, and Osborn, New York.

Descriptors: (*Management engineering, Economics), (*Economics, Management engineering), (*Decision making, Economics), Operations research, Probability, Optimization, Mathematical programming, Decision theory

DEMON (Decision Mapping via Optimum GO-NO Networks) is a chance-constrained programming model for use in developing a strategy for marketing new products where, inter alia, the pertinent statistical distributions are only partially known and, in fact, may change in response to the strategies employed. The present report depicts DEMON in terms of the decision-and-information networks which are of primary concern for managements confronted with problems in new product marketing. In addition the recursion relations used to establish an optimal marketing plan are discussed in a case history context. (Author)

AD-622 023 Div. 26/2 ,18/3
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP BETHESDA MD
COST-EFFECTIVENESS: ESTIMATING SYSTEMS COSTS,
by J. D. McCullough. Sep 65, 27p. Rept. no. P-3229
Unclassified report

Prepared for presentation on a panel on 'The Use and Estimation of Costs' at symposium on Cost-Effectiveness Analysis sponsored by Washington Operations Research Council 14-16 Jun 65.

Descriptors: (*Costs, Weapons systems), (*Systems engineering, Costs), Effectiveness, Budgets, Decision making, Maintenance, Life expectancy, Specifications, Management engineering, Statistical analysis, Graphics

The discussion of concepts, principles, and the general approach toward the development of system cost estimates is intended primarily for users of estimates, rather than for cost analysts. An understanding of cost analysis can assist considerably in the use of cost estimates. Both the value and limitations of such estimates should be better understood for their proper application in costeffectiveness analysis. Emphasis must be shifted toward an evaluation of the validity of the study itself and the analysis underlying it. Data, methods, and conclusions must be subjected to intelligent and critical review.

AD-622 109 Div. 26/2 ,18/3
CFSTI Prices: HC $2.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
MODELS IN COST-EFFECTIVENESS ANALYSIS: AN EXAMPLE,
by Oliver Bryk. Jun 65, 33p. Rept. no. RAC-P-2
Unclassified report

Descriptors: (*Costs, Weapons systems), Mathematical models, Systems engineering, Effectiveness, Aircraft, Maintenance, Armed forces procurement, Budgets, Optimization, Maintenance personnel, Graphics

The paper was presented at the 21st Annual National Forum of The American Helicopter Society on 13 May 1965. It describes some approaches to modeling for systems analysis or cost-effectiveness studies. (Author)

AD-622 112 Div. 26/2 ,18/3
CFSTI Prices: HC $2.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
AN INTRODUCTION TO COST-EFFECTIVENESS ANALYSIS,
by Robert N. Grosse. Jul 65, 32p. Rept. no. RAC-P-5
Unclassified report

Descriptors: (*Costs, Weapons systems), Effectiveness, Systems engineering, Mathematical models, Decision making, Labor, Machines, Budgets, Aircraft, Optimization, Graphics

The paper is a written version of a lecture designed to show the basic theory underlying cost-effectiveness analysis and to be a beginning for developing the tools and language that would permit greater ease in use and understanding of cost-effectiveness analysis. (Author)

AD-622 114 Div. 30/1
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
ASPECTS OF COST AND UTILITY ANALYSIS IN PLANNING.
Paper,
by Oliver Bryk. 12 Aug 65, 14p. Rept. no. RAC-P-8
Unclassified report

Prepared for presentation at the International Meeting of the Institute of Management Sciences (12th), 8 Sep 64, Vienna, Austria.

Descriptors: (*Management planning, Analysis), Costs, Decision making, Distribution

Some aspects of planning in preparation for resourceallocation decisions among alternatives, which are generally made under uncertainty, are discussed from the pragmatic viewpoint of a practicing analyst. The report is concerned only with that area of economic analysis in which the inputs are not commensurable with the outputs. (The terms 'input' and 'output' will be used throughout this paper in their general meaning and not in the specialized meaning attached to them in input-output or intersectoral economics.)

AD-622 202 Div. 30/1 ,8/7 ,8/2 ,8/6
CFSTI Prices: HC $6.00 MF $1.25
PURDUE UNIV LAFAYETTE IND SCHOOL OF ELECTRICAL ENGINEERING
ELECTRICAL AND ELECTRONICS ENGINEERING RESEARCH.
Semi-annual research summary no. 2, Jan-Jun 65. Jun 65, 207p.
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Electrical engineering, Reports), (*Electronics, Reports), Speech transmission, Artificial intelligence, Pattern recognition, Mathematical models, Networks, Energy conversion, Electromagnetic waves, Plasma physics, Communication theory, Communication equipment, Materials, Semiconductors, Magnetic materials, Electrochemistry, Bionics

Contents: Medical and life sciences, biological systems and electrophysiology; control and information systems, automata and artificial intelligence; electric power systems and energy conversion; electromagnetic fields; electronic systems research laboratory; materials.

AD-622 250 Div. 26/2 ,32/4 ,15/1
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
DATA, MODELING AND DECISIONS.
Systems research memo.,
by A. Charnes, and W. W. Cooper. Jun 65, 15p.
Rept. no. SRM-127
Contract Nonr122810 Proj. NR047 021
Unclassified report

Prepared in cooperation with Carnegie Inst. of Tech., Pittsburgh, Pa. Contract Nonr76024, Proj. NR047 048.

Descriptors: (*Economics, Decision making), (*Management planning, Optimization), (*Mathematical models, Management planning), (*Decision making, Management planning), Data, Operations research, Scheduling

Past experience with models--and related methods of analysis--may be an inadequate guide for managers considering a use of new tools now available. The latter, viewed as multiple-variable systems models, may differ in their data requirements and decision possibilities in comparison with predecessors that could handle only a few variables at a time. In approaching these new tools it is desirable to consider using the models as guides to data collection as well as decisions. This refers not only to data variety but also to data quality as judged by reference to the model itself. It may then be possible to eliminate needless expenditures of time and money on collecting or refining data. It is also desirable to consider integrating the modelling and decision making. Evaluations may then be secured which can guide alterations to the model and also open new decision possibilities which would otherwise not be apparent. The value of such a joint approach to data, models and decisions is examined and illustrated in the following article with special reference to media mix and new products marketing applications. (Author)

AD-622 251 Div. 26/2 ,32/4 ,15/1
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
DEMON, MARK II: EXTREMAL EQUATIONS SOLUTION AND APPROXIMATIONS.
Systems Research memo.,
by A. Charnes, W. W. Cooper, J. K. DeVoe, and D. B. Learner. Apr 65, 23p. Rept. no. SRM-122
Contract Nonr122810 ,Nonr76024 Proj. NR047 021,NR047 048
Unclassified report

Prepared in cooperation with Carnegie Inst. of Tech., Pittsburgh, Pa., and Batten, Barton, Durstine and Osborn, Inc., New York.

Descriptors: (*Economics, Decision making), (*Decision making, Economics), (*Equations, Linear programming), Management planning

This paper develops a new method for the solution of DEMON-type functional equations. It is shown how the latter can be reduced to solution of a separated system of simpler equations which, for discrete distributions, can be solved by linear programming methods. The reduction also permits general characteristics of the solutions to be inferred. Additionally, methods of approximation and bounding are developed and interpreted for the general case. Because of the importance accorded to log-normal distributions for the new-product marketing problems, further details and developments are undertaken with reference to this class of distributions and then illustrated by reference to the single-parameter case. (Author)

AD-621 688 See Fld. 5/9

AD-622 045 See Fld. 15/5

AD-622 074 See Fld. 15/5

AD-622 075 See Fld. 15/5

AD-622 269 See Fld. 5/3

5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY

AD-621 800 Div. 32/3
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE SYSTEMS COMMAND WASHINGTON D C
PROCEEDINGS OF THE AIR FORCE SECOND SCIENTIFIC AND TECHNICAL INFORMATION CONFERENCE, 28-29 APRIL 1965.
Sep 65, 77p.
Unclassified report

Descriptors: (*Air force research, Documentation), (*Information retrieval, Symposia), Libraries, bibliographies, Indexes, Scientific research, Department of Defense, United States Government

The report contains various papers read and working group reports developed at the AF STINFO Conference. (Author)

AD-622 110 See Fld. 9/2

5/3. ECONOMICS

AD-621 843 Div. 32/4
WISCONSIN UNIV MADISON
CROSS-CULTURAL RESEARCH BY U. S. CORPORATIONS,
by S. Watson Dunn. 1965, 4p. Contract Nonr120224
Unclassified report

Pub. in Journalism Quarterly v42 n3 (Summer 1965). (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Commerce, Social communication), Culture, Economics, Costs, Money, Effectiveness, Public opinion, Personnel

During 1964 a series of case studies of U. S. corporations was conducted by the author as part of a larger research project designed to find out under what conditions successful persuasive messages in one culture might also be successful in another. It was hoped that through a series of case studies, followed by field experiments in certain foreign countries, it would be possible to isolate some of the important variables which determine the transferability of persuasive messages. Consequently it was necessary to investigate in considerable detail the extent to which certain leading American corporations were testing the effectiveness of their foreign advertising messages. Included in the sample were thirty large American corporations, all of whom were large advertisers both domestically and internationally. Interviews with executives of the companies were followed by extended sessions with their advertising agencies. Interviews were held also with the research heads of two large international media and with four executives in research firms active in the international testing of advertising.

AD-622 269 Div. 32/4 ,26/2
CFSTI Prices: HC $2.00 MF $0.50
CENTER FOR NAVAL ANALYSES WASHINGTON D C
THE EVALUATION OF NON-MARKETABLE INVESTMENTS,
by V. L. Broussalian. 30 Jun 65, 38p. Rept. no. research Con-15
Contract Nonr373200
Unclassified report

Descriptors: (*Economics, Analysis), Government procurement, Decision making, Costs, Commerce, Banking

The evaluation of non-marketable investments, of which defense projects are the most typical, presents difficulties not encountered in the case of marketable investments. The net effect of these difficulties is to render the operation of discounting, which is implied by economic theory for the evaluation of marketable investments, meaningless. Hence the search for a theoretically correct rate of discount to apply to such investments is bound to be futile. The benefits and costs of a non-marketable investment must ultimately be evaluated directly without the intermediate step of discounting. However, there is one type of investment decision, namely the ranking of systems whose benefits are specified, for which a meaningful present value criterion can be applied. The ranking of such systems can be accomplished on the basis of the present value of their costs, if the government borrowing rate is used as the discount rate. The rationale for using this rate, and hence the meaning of the present value calculated with it, differ from their counterparts in marketable investments. Here, they merely refer to the cost of obtaining the time-pattern of taxation deemed by government to be desirable for financing the system eventually adopted. All other types of investment decisions, including the accept-or-reject type, do not admit of any present value criterion. (Author)

AD-621 910 See Fld. 5/1

AD-622 250 See Fld. 5/1

AD-622 251 See Fld. 5/1

5/4. HISTORY, LAW AND POLITICAL SCIENCE

AD-621 636 Div. 32/6 ,1/5
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
SOME ASPECTS OF GOVERNMENT LIABILITY IN MILITARY AIRCRAFT ACCIDENTS,
by William J. Colley, and Frank W. Kiel. 1965, 2p.
Unclassified report

Pub. in Aerospace Medicine v36 n7 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Law, Aviation accidents), (*Aviation accidents, Law), (*United States Government, Aviation accidents), Armed forces (United States)

Liability of the U.S. government for military aircraft accidents is based on statutes enacted in Congress. With 30,000 military aircraft being involved in 1,300 accidents per year, resulting in 500 deaths, there is an increasing need for adequate compensation to injured persons. The Federal Tort Claims Act and the Military Claims Act are two major laws allowing recovery against the United States. The courts have held, however, that military personnel on active duty may not recover from the government for injuries received incident to service. In certain circumstances the injured serviceman may be able to sue successfully the original manufacturer of the aircraft.

AD-621 695 Div. 32/8
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
MINISTRIES AND STATE COMMITTEES OF THE GOVERNMENT OF THE USSR.

Review article.
26 Aug 63, 28p. Rept. no. AID-63-109
TT , 64-15357
Unclassified report

Descriptors: (*Government (Foreign), USSR), Supervisory personnel, Communists, Economics

AD-621 644 **See Fld. 15/3**

AD-622 108 **See Fld. 15/3**

5/6. HUMANITIES

AD-621 660 Div. 32/10,2/6
MARINE PHYSICAL LAB UNIV OF CALIFORNIA SAN DIEGO
MAGNETIC PROSPECTING IN SOUTHERN CALIFORNIA,
by Paul Ezell, James R. Moriarty, John D. Mudie, and Anthony I. Rees. Nov 64, 4p. Rept. no. MPL-U-41/64
Contract Nonr221601 ,Nonr221605
Unclassified report

Pub. in American Antiquity v31 n1 p112-3 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Geophysical prospecting, California), (*Archaeology, Magnetometers), (*Magnetometers, Archaeology), Magnetic properties, Paleontology, Protons, Magnetometers, Terrestrial magnetism

A proton magnetometer was used in a magnetic survey of a site near San Diego, California. Two hearths and a fire pit were located which otherwise would not have been discovered without extensive excavation. Magnetic surveying of a site in southern California has proved successful and further use of the method in North America is warranted. (Author)

5/9. PERSONNEL SELECTION, TRAINING AND EVALUATION

AD-621 627 Div. 23/5 ,31/4 ,31/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL PERSONNEL PROGRAM SUPPORT ACTIVITY WASHINGTON D C PERSONNEL RESEARCH LAB
A PRELIMINARY STUDY OF MAN IN THE SEA DIVER PERSONNEL AND TRAINING IMPLICATIONS,
by A. S. Propst. Jul 65, 40p. Rept. no. WRM-66-5
Unclassified report

Descriptors: (*Diving, Naval personnel), (*Naval personnel, Scuba divers), (*Scuba divers, Training), Selection, Personnel management, Military requirements, Hazards, Wages, Breathing apparatus, Underwater clothing, Underwater equipment, Sonar equipment, Navigation aids, Safety devices, Underwater communication systems, Oceanographic equipment, Television communication systems, Lighting equipment, Salvage

The report provides the Chief of Naval Operations, Bureau of Naval Personnel, Special Projects Office, Fleet Commanders, and Naval schools with preliminary information related to the diver personnel and training requirements for the Man-in-the-Sea Program, and was prepared at the request of Pers-A41 (Personnel Program Management Division). The research memorandum discusses projected diver requirements in the Navy and includes a review of existing and anticipated skills and knowledges, depth qualifications, equipment knowledge required, personnel selection prerequisites, hazardous duty implications, NEC and diving pay considerations, types of underwater tasks performed, and new technical skills required. Comparison of existing, versus projected diver personnel and training requirements are discussed and reviewed in light of requirements envisioned for an on-going man-in-the-sea effort within the Navy. (Author)

AD-621 679 Div. 23/5
CFSTI Prices: HC $4.00 MF $0.75
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
TRAINING, UTILIZATION, AND PROFICIENCY OF NAVY FIRE CONTROL TECHNICIANS.
Technical bulletin for Sep 63-Jul 64,
by C. R. Bilinski. Jul 65, 117p. Rept. no. STB-66-2
Proj. PF017030302
Unclassified report

Descriptors: (*Naval personnel, Naval training), (*Technicians, Fire control systems), (*Naval training, Fire control systems), Performance (Human), Operators (Personnel), Psychometrics, Maintenance, Electronic equipment, Test equipment

A survey of the training, proficiency, and utilization of a five per cent sample of Navy FT's assigned to Pacific Fleet and western continental United States commands was conducted from September 1963 to July 1964. All rates from Seaman to Master Chief were represented in the approximately random sample of 164 FT's. Results of the administration of a check list, performance and knowledge tests, rating scales, and work diaries are presented. FT's appear to be adequately trained to operate equipment, but maintenance training, including training in the use of test equipment and troubleshooting, appears to need improvement. Evidence obtained suggests that utilization of technical FT skills should be critically reviewed. (Author)

AD-621 688 Div. 23/1 ,26/2 ,26/3
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES WESTERN MANAGEMENT SCIENCE INST
LABOR ASSIGNMENT AS A DYNAMIC CONTROL PROBLEM.
Report on Management Sciences Research Project,
by Rosser T. Nelson. Aug 65, 17p. Rept. no. working paper no. 87
Contract Nonr23373 Proj. NR047 003
Unclassified report

Descriptors: (*Labor, Management control systems), (*Management control systems, Labor), Production control, Optimization, Queueing theory, Dynamic programming

A problem of labor assignment in a labor and machine limited production system is formulated as a dynamic control problem. The Pontryagin maximum principle is employed to obtain properties of the optimal unconstrained labor assignment procedure. The result indicates a boundary type of control, independent of time. The specifications defining the set of admissible controls leads directly to the constrained optimal solution. Some examples are given to illustrate the nature of the fixed priority policies which depend upon the system state (queue lengths) only indirectly through a restriction on admissible policies. A number of limiting assumptions and omissions which facilitated analytical resolution of the problem are discussed to emphasize the importance of simulation as a research medium for the study of systems control problems. (Author)

AD-621 698 Div. 23/1 ,23/5 ,28/4
CFSTI Prices: HC $2.00 MF $0.50
ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C
EVALUATION OF DIFFERENTIAL CLASSIFICATION TESTS FOR THE ACB.
Technical research note,
by William H. Helme. Jun 65, 32p. Rept. no. TRN-155
Proj. DA2J024701A722
Unclassified report

Descriptors: (*Army personnel, Selection), (*Psychometrics, Effectiveness), Aptitude tests, Army training, Analysis of variance, Electronic technicians, Performance (Human)

The purpose of the research is to develop psychological measures that will increase the effectiveness of operational classification of enlisted men so that in training and assignment the Army can make optimal use of the potential and developed skills of its manpower resources. The current phase of research on classification techniques is directed toward integration of findings on test effectiveness in a reorganized Army Classification Battery and a reconstituted system of aptitude areas. A battery of 21 experimental tests, plus current operational tests, was analyzed over a broad range of military occupational specialties (MOS) to identify the most effective tests or combination of tests for differential prediction of final grade in the appropriate Army training course. Twenty MOS samples with heavy representation of jobs in the electronics and electronics repair area were used. Tests selected for maximum absolute validity across MOS were compared with those selected to yield maximum differentiation among the MOS studied. Patterns of validity reflected the usefulness of key ACB tests--Arithmetic Reasoning, Automotive Information, Electronics Information, Verbal, and Army Clerical Speed--in differentiating between broad MOS groups. Newly developed motivation-type scales contributed substantially. Perceptual measures and arithmetic operations tests appeared promising.

AD-621 699 Div. 23/1
CFSTI Prices: HC $2.00 MF $0.50
ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C
LOGICAL MODEL REPRESENTING PERSONNEL FLOW IN THE U.S. ARMY: CONSIDERATIONS RELATIVE TO REDUCTION OF TURBULENCE.
Technical research note,
by Richard C. Sorenson. Jul 65, 41p. Rept. no. TRN-156
Proj. DA2J024701A723
Unclassified report

Descriptors: (*Army personnel, Personnel management), (*Personnel management, Manpower studies), Officer personnel, Feasibility studies, Mathematical models, Management planning, Computers, Factor analysis

The purpose of the research is to study the feasibility of evaluating projected modifications in Army manpower management policy by means of a logical model of the officer personnel system, with special reference to the utility of such modifications for the objective of reducing turbulence. A logical model was developed to represent flow in the U. S. Army personnel system. Application of the model to the assessment of personnel policy alternatives with regard to the objective of turbulence reduction was demonstrated by introducing hypothetical allocation proportions. Certain theoretical restrictions were specified with respect to important system characteristics-type of duty tour, flow of personnel, duration of tours, allocation of personnel, alternation policy--and results of applying the particular type of model were indicated. A catalog of feasible flow constants resulting from policy alternatives concerned with allocation proportions and tour durations was prepared. The model demonstrated that it can be used to identify infeasible allocation proportions and tour durations. Results established the close interdependence of the five characteristics of the Army personnel system selected for inclusion in the model. Sensitivity of the total personnel system to slight changes in allocation proportions and tour durations was clearly evident. It was also shown that certain subgroups with a relatively large proportion of officers on short tour of duty in critical overseas areas could contribute heavily to personnel turbulence.

AD-621 700 Div. 23/1 ,28/4
CFSTI Prices: HC $2.00 MF $0.50
ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C
VALIDATION OF EXPERIMENTAL TOOL AND TRADE KNOWLEDGE TESTS.
Technical research note,
by William H. Helme. Aug 65, 26p. Rept. no. TRN-157
Proj. DA2J024701A722

Unclassified report

Descriptors: (*Army personnel, Selection), (*Psychometrics, Effectiveness), Aptitude tests, Army training, Optimization, Performance (Human), Correlation techniques

The purpose of the research is to develop new and replacement tests for the Army Classification Battery and to maintain the effectiveness of the battery so that the Army can make optimal use of the potential and developed skills of enlisted men. In particular, updated measures of mechanical information were needed which would better predict performance in construction and related mechanical jobs requiring moderate technical skills. Experimental tool knowledge and trade knowledge measures were developed and administered to samples of enlisted men in advanced individual training courses in five construction job areas. One measure of tool knowledge and two of trade knowledge were derived in each sample. The 25-item tests were cross-validated in independent samples. Parameter values were obtained in a general enlisted input sample (N=616). Composites in which the experimental tests were substituted for operational ACB mechanical aptitude measures were compared with ACB composites in terms of predictive effectiveness. Contribution of the new tests to differential classification was estimated from their regression weights as part of the full ACB. The 25-item Tool Knowledge and Trade Knowledge tests were generally more effective perdictors of training performance in the five construction MOS than the currently operational Mechanical Aptitude and Shop Mechanics tests. As components of aptitude area scores, the new tests also gave promise of better differential prediction of performance than is achieved with MA or SM.

AD-621 701 Div. 23/1 ,28/4
CFSTI Prices: HC $2.00 MF $0.50
ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C
VALIDATION OF EXPERIMENTAL ELECTRONICS INFORMATION TESTS FOR ENLISTED CLASSIFICATION.
Technical research note,
by William H. Helme. Aug 65, 28p. Rept. no. TRN-158
Proj. 2J024701A722

Unclassified report

Descriptors: (*Army personnel, Selection), (*Psychometrics, Effectiveness), Army training, Electronics, Performance tests, Analysis, Aptitude tests

The purpose of the research is to develop new and replacement tests for the Army Classification Battery and to maintain the effectiveness of the battery so that the Army can make optimal use of the potential and developed skills of enlisted men. In particular, updated measures of electronics information were needed which would better differentiate the more highly technical MOS from electrical repair jobs. Four experimental measures of electronics information, two predominately pictorial and two verbal, were developed and administered to samples of enlisted men in electronics and related MOS Army school courses. Based on item analysis, four 20-item scales were selected and validated in samples of eight additional electronics and electrical courses. Parameter values were obtained in a general enlisted input sample (N=610). The 20-item experimental tests were more effective than the operational Electronics Information Test (ELI) in predicting performance in all electronics MOS and in the more highly technical of the electrical maintenance MOS. The new tests made greater contribution than did ELI to prediction of MOS training performance afforded by the full Army Classification Battery. Composites in which the new tests were substituted for ELI were also more effective differential predictors than were the ELI composites. The experimental tests were incorporated in a comprehensive validity analysis now being conducted across all Army occupational areas. Results will determine which test should replace ELI in the reconstituted enlisted classification system scheduled for implementation in FY 1967.

AD-621 807 Div. 23/5 ,12/1 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
BIOLOGICAL DATA ON THE SPACE FLIGHTS OF A. NIKOLAEVICH AND P. POPOVICH. (SUPPLEMENT: TRAINING OF COSMONAUTS),
by R. Ryabchikov, Vladislav Loginov, and Leonid Salmanov. 28 Sep 62, 4p. Rept. no. AID-62-157 TT , 65-64058

Unclassified report

Trans. from Pravda, Moscow (USSR) 7 Aug p4 1962; and from Kommunist, Erevan (USSR) 8 Sep p3 1962.

Descriptors: (*Astronauts, Training), (*Training, Astronauts), (*Space flight, Training), Space environmental conditions, Simulation, Weightlessness, Motion, Space biology, Space medicine, High-altitude, Training devices, USSR

AD-621 923 Div. 23/4 ,28/1
CFSTI Prices: HC $1.00 MF $0.50
ILLINOIS UNIV URBANA TRAINING RESEARCH LAB
CORRECTION AND REVIEW ON SUCCESSIVE PARTS IN LEARNING A HIERARCHICAL TASK,
by M. David Merrill. 1965, 3p. Contract Nonr398504

Unclassified report

Proceedings of the Annual Convention of the American Psychological Association (73rd), held at Chicago, Ill., Jul 65.

Descriptors: (*Learning, Teaching machines), (*Teaching machines, Learning), Effectiveness, Programming (Computers), Tests, Errors, Retention, Analysis of variance

A common assumption, supported by the theoretical formulations of Ausubel (1963) and Gagne (1965) and the programming techniques advocated by Crowder (1960), is that learning and retention of a hierarchical task are both facilitated by mastering each successive part before proceeding to the next part. On the basis of this assumption it was hypothesized that; in a hierarchical learning task, (a) if part I is mastered, Ss are able to learn part II faster and with fewer errors than if part I is not mastered before proceeding to part II, etc.; (b) when the terminal test requires every S to review previously presented materials until he is able to answer every question correctly, Ss who are required to master each successive part of the task before proceeding take less total time to master the terminal test than Ss who proceed from part to part with no requirement of mastery; (c) Ss who are required to master each successive part of the task before proceeding retain the material better than Ss who proceed from part to part with no requirement of mastery even when the terminal test requires every S to review previously presented materials until he is able to answer every question correctly. (Author)

AD-621 947 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF A PROPOSED INSTRUMENT SEQUENCE. PART I: ACROBATIC STAGE CRITERIA.
Special rept.,
by John A. Creelman. 28 Apr 55, 8p. Rept. no. SR-55-5

Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Instrument flight, Training), Instructors, Students, Performance (Human), Training devices, Flight, Statistical analysis

The report is the first of a series of five successive investigations in the evaluation of the proposed integrated instrument syllabus. It deals with acrobatic stage proficiency, and seeks to determine whether the early introduction of instrument training facilitates or interferes with ability in concurrent contact flying.

AD-621 948 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
COMMENTS ON TRAINING CONDITIONS BY INSTRUCTORS.
Special rept.,
by Fred E. Fiedler. 12 Jul 55, 9p. Rept. no. SR-55-8
Proj. NR170 106

Unclassified report

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Descriptors: (*Naval training, Aviation personnel), Instructors, Students, Flight, Training, Instruction manuals, Tests, Sociometrics

Instructors at Saufley Field were given the opportunity to comment on and make suggestions concerning improvement of student training. The instructors' replies concerned the following: (1) More effective coordination between ground and flight training; (2) More effective use of rainy weather time; (3) More written exams; (4) Improving the 'flow' of students; (5) Fewer collateral duties for instructors; (6) More joint student-instructor activities; (7) Quality rather than quantity of students; (8) Flexibility of the training manual; (9) More training in English for foreign students.

AD-621 949 Div. 23/5 ,23/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
SOURCES OF INFORMATION FOR APPLICANTS OF NAVAL AIR TRAINING PROGRAM.
Special rept.,
by John T. Bair. 3 Aug 55, 10p. Rept. no. SR-55-10

Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Personnel management, Naval personnel), (*Recruiting, Naval personnel), Social communication, Effectiveness, Analysis, Information retrieval, Sources

The report concerns procurement of naval aviation cadets. Specifically, the purpose of the project is to provide answers to the following questions; (1) How do cadets first hear about the Naval Air Training Program, (2) What are the primary sources of information about the program, (3) Who first influenced their thinking about joining the program, (4) What contributed most to their decision to volunteer for naval flight training. (Author)

AD-621 950 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
RECENT TRENDS IN ATTRITION OF STUDENT AVIATORS IN THE NAVAL AIR BASIC TRAINING PROGRAM.

Special rept.,
by John T. Bair, and Rosalie K. Ambler. 17 Feb 55, 8p. Rept. no. SR-55-3 ,AR-17
Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Pilots, Training), Flight, Instructors, Students, Attitudes, Anxiety, Graphics

The primary purpose of this research was to compare reasons for withdrawal from the Naval Air Basic Training Program for January 1955 with the reasons in January 1954 and 1953. A comparison of the flight failure - voluntary withdrawal ratio also was made for calendar 1954 and 1953. The findings were: (1) The most stable reasons for withdrawal from the program were the factors associated with flying; less stable were the factors associated with external influences and attitudes toward the military. (2) There has been a striking reduction in the ratio of voluntary withdrawals to flight failures from calendar 1953 to 1954. (Author)

AD-621 951 Div. 23/5 ,23/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
AN EVALUATION OF THE EFFECTIVENESS OF NAVCAD PROCUREMENT TEAMS.
Special rept.,
by John T. Bair, Rosalie K. Ambler, H. Paul Kelly, William F. O'Conner, and Robert B. Voas. 5 Aug 55, 7p. Rept. no. SR-55-11
Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Recruiting, Naval personnel), Effectiveness, Selection, Personnel management, Social communication, Background, Job analysis, Flight

Naval aviation cadets have been assisting in procuring fellow flight students from January 1955 through June 1955. About one out of every three cadets completing basic flight training was sent to his 'home' reserve station for this duty for a period of approximately two weeks. The primary purpose of the study is to provide information concerning the effectiveness of this program. Specifically, the following areas are covered in this report: (1) types of questions asked these cadets by prospects, (2) relationships of cadets with procurement officers, (3) recommendations of cadets to improve these visitation periods. (Author)

AD-621 952 Div. 23/5 ,28/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
ANXIETY AND FLYING: I. AN INTRODUCTION TO THE PROBLEM.
Special rept.,
by John T. Bair, and William F. O'Connor. 23 Aug 55, 18p. Rept. no. SR-55-13
Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Aviation personnel, Anxiety), (*Anxiety, Naval personnel), Flight, Students, Fear, Public opinion

This report is the first of a series of studies designed to present a clearer picture of students' anxieties about flying. It presents in detail interviews with two types of flight students. The first interview is with a group of eight students who demonstrate normal concerns toward flying and the second is with a student who manifests an unhealthy dread of flying. The contrast is all the more vivid since it is the cadets themselves who are speaking. The data presented here represents the real feelings of individuals facing a real situation. (Author)

AD-621 954 Div. 23/5 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
TRAINING COMMAND GRADES ON FLEET SUCCESSFUL AND UNSUCCESSFUL PILOTS.
Special rept.,
by Wilse B. Webb. 25 Aug 55, 9p. Rept. no. SR-55-14
Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Pilots, Naval training), Psychometrics, Performance tests, Effectiveness, Selection, Flight, Students

It is clear that the unacceptable men were inferior during training. The Pre-Flight ground school grades, the A and B flight stage grades, and the over-all basic flight performance clearly distinguished between the groups. Other measures, however, did not in any way distinguish the groups: the G, I, and L stage grades, the ground school and OLQ grades of basic and advanced training, the number of boards, the number of accidents, and the selection test scores. Other measures enjoyed intermediate success. Discussion of the implications of the findings are included in the report. (Author)

AD-621 956 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF A PROPOSED INSTRUMENT SEQUENCE: PART II. BASIC NON-INSTRUMENT PROFICIENCY.
Special rept.,
by John A. Creelman. 24 Oct 55, 6p. Rept. no. SR-55-16
Unclassified report

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Descriptors: (*Naval training, Aviation personnel), (*Instrument flight, Training), Learning, Instruction manuals, Students, Instructors, Pilots, Effectiveness

The report evaluates the training effectiveness of a proposed integrated instrument syllabus by comparing experimental (integrated) and control groups with respect to criteria of proficiency in the tactical, gunnery, FCLP, and carrier qualification phases of basic training, and the measures of over-all basic proficiency. The purpose is to determine whether the introduction of instrument instruction early in basic training (during acrobatic stage) either facilitates or interferes with the acqusition of skills in these phases of training. Findings indicate that the integrated instrument syllabus had a facilitative effect on several available gross measurements of noninstrument flight proficiency.

AD-621 960 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE EFFECTS OF FOUR INSTRUCTIONAL FLIGHTS DURING PRE-FLIGHT INDOCTRINATION.
Special rept.,
by Rosalie K. Ambler, and J. R. Berkshire. 15 Jul 60, 16p. Rept. no. SR-60-5
Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Pilots, Training), Instructors, Students, Flight, Motivation, Attitudes, Performance (Human), Effectiveness, Tables

The purpose of this research was to evaluate the effects of four instructional flights given during indoctrination upon subsequent student motivation and performance in pre-flight and basic flight training. The evidence from the analyses was generally favorable toward the concept of indoctrination flights. Reduced attrition and enhancement of performance were demonstrated. It is not possible, however, to guarantee that these benefits would continue if all students were given this treatment. The most certain advantage to be gained from this program would be to use it, or some modification thereof, for the early elimination of men who have a high probability of failing later. It was demonstrated that certain predictions and observations recorded by the flight instructor after the four flights were useful for this purpose. (Author)

AD-621 961 Div. 23/5 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
INCREASING THE ACCURACY OF PREDICTIONS OF PRE-FLIGHT TECHNICAL COURSE GRADES.
Special rept.,
by L. K. Waters. 14 Oct 60, 7p. Rept. no. SR-60-8
Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Aptitude tests, Pilots), Flight, Training, Engineering, Physics, Mathematics, Mechanics, Verbal behavior, Performance (Human), Correlation techniques

The purpose of this study was to investigate the usefulness of a commercially available engineering and physical science aptitude test for increasing the accuracy of predictions of pre-flight technical grades. Correlational analysis showed that increases in the accuracy of predictions of pre-flight technical course performance were obtained by adding Engineering and Physical Science Aptitude Test scores to current selection test scores in a weighted composite. (Author)

AD-621 962 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF MIDSHIPMEN AVIATION SUMMER CRUISES 1960.
Special rept.,
by Rosalie K. Ambler. 9 Nov 60, 10p. Rept. no. SR-60-9
Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Aviation personnel, Recruiting), Naval personnel, Attitudes, Flight, Training, Students, Training

The purpose of this study was to determine if the air indoctrination cruises for U. S. Naval Academy midshipment influenced their attitudes toward naval aviation and their stated intentions of entering the program after graduation from the Academy. The results indicated that the cruises accomplished the goals of: (1) increasing interest in and knowledge about naval aviation, and (2) increasing the number of midshipmen who stated the definite intention of entering naval aviation. (Author)

AD-621 963 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF NROTC AVIATION FIELD INDOCTRINATION TOURS FOR 1960-1961,
Special rept.,
by Rosalie K. Ambler. 2 Oct 61, 11p. Rept. no. SR-61-10
Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Aviation personnel, Recruiting), Naval personnel, Flight, Training, Attitudes, Students, Tables

The purpose of the research was (1) to determine the effects of the NROTC Aviation Field Indoctrination Tours upon incidental learning about and attitudes toward naval aviation, and (2) to compare the current findings with results from previous studies of Naval Academy and NROTC students. The results indicated a significant increase in incidental knowledge about naval aviation and a favor-

able attitude shift after the students experienced the tours. The findings closely parallel results from previous studies of Naval Academy and NROTC air indoctrination groups. (Author)

AD-621 969 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF NROTC AVIATION INDOCTRINATION FIELD TOURS FOR 1962-1963.
Special rept.,
by Rosalie K. Ambler. 14 Oct 63, 16p. Rept. no. SR-63-3

Unclassified report

Descriptors: (*Aviation personnel, Recruiting), (*Naval training, Aviation personnel), Students, Universities, Attitudes, Officer personnel, Pilots, Statistical analysis, Tables

The purpose of this study was to evaluate the effectiveness of the 1962-63 NROTC Aviation Indoctrination Field Tours by identifying changes in the students' knowledge about and attitudes toward aviation and by determining the students' attitudes toward the tour experience. Comparisons with previous NROTC and U. S. Naval Academy groups also were made. As in previous studies the results indicated a favorable endorsement of the AIFT concept. There was strong evidence that the tour contributed to a more realistic picture of naval aviation and an increase in the perceived status of naval aviation. There was evidence, however, that information about the Naval Aviation Officer (NAO) Program was not reaching all of the students. (Author)

AD-621 970 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE U. S. NAVAL ACADEMY SUMMER CRUISES: A LOOK AT THE LATEST ONE AND A FOLLOW-UP OF AN EARLIER ONE.
Special rept.,
by Rosalie K. Ambler. 10 May 64, 22p. Rept. no. SR-64-1

Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Aviation personnel, Naval training), Attitudes, Students, Motivation

This study served a twofold purpose: (1) To evaluate the effectiveness of the 1963 Air Indoctrination Cruises for U. S. Naval Academy midshipmen by identifying changes in knowledge about and attitudes toward aviation and by determining attitudes toward the cruise itself. (2) To evaluate further the cruise concept by studying an earlier cruise group (1961) that has had an opportunity to enter flight training. As in previous studies the results indicated a favorable endorsement of the cruise concept. There was strong evidence that the cruise contributed to a more realistic picture of naval aviation and an increase in the perceived status of naval aviation. The 1963 group had fewer men than earlier groups expressing the intention of entering aviation; and it was demonstrated that this was probably related to the fact that there was an increase in this group in the number of men who felt that they were not physically qualified for flight. An extremely small portion of the group expressed the intention of entering the NAO program. With respect to the follow-up study it was demonstrated that those influenced positively by the cruise, as determined by their stated intentions toward aviation before and after the cruise, had a considerably higher rate of actual entry into flight training than those not changing or those shifting negatively. Furthermore, those who shifted positively outnumbered those shifting negatively about 2 1/2 to 1. (Author)

AD-621 999 Div. 23/1 ,23/4 ,28/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
A METHOD FOR SYSTEM TASK ANALYSIS USING STATISTICAL DECISION THEORY.
Professional paper,
by Lawrence T. Alexander, and Alvin S. Cooperband. 12 Aug 65, 17p. Rept. no. SP-2168

Unclassified report

Presented at the American Psychological Association Meetings, Chicago, Ill., Sep 65.

Descriptors: (*Performance (Human), Decision theory), (*Decision theory, Performance (Human)), Performance tests, Psychometrics, Systems engineering, Statistical analysis, Detection, Probability

For system tasks involving detection, a method is presented by which statistical decision theory may be used to derive limiting conditions for adequate operator performance from results obtained in an abstract laboratory task. The limiting conditions may then serve as a basis for making design decisions regarding functions allocation and for specifying operating rules and requirements. The method is illustrated with a collision-prediction task, where two visually displayed objects move on converging paths, in which previous research suggests that performance depends on the ability to detect a nonzero rate of change in the relative bearing between the two objects. (Author)

AD-622 004 Div. 23/1
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
MAN-JOB MATCHING AND PERSONNEL INFORMATION MANAGEMENT.
Professional paper,
by John M. Leiman. 3 Aug 65, 18p. Rept. no. SP-2160

Unclassified report

Prepared for presentation at the NATO Conference on Operational and Personnel Research in the Management of Manpower Systems at Brussels (Belgium) 16-20 Aug 65.

Descriptors: (*Manpower studies, Job analysis), (*Job analysis, Manpower studies), (*Personnel management, Psychometrics), Performance (Human), Personality, Motivation, Reviews, Analysis of variance

The paper provides: a description of a model for the man-job matching process; a discussion of the various constraints and assumptions necessary to make the model applicable to typical operational conditions; and a discussion of the state-of-the-art in the prediction of job performance in new assignments. 'Hard' variables are defined as personal characteristics which are related to measurements of a man's current skills and knowledge -these were found to account for about half the variance in job performance in new assignments. 'Soft' variables are defined as personal characteristics related to a man's motivation or the manner in which he applies his skills and knowledge in new situations -- these were found to have only marginal utility in the prediction of performance in new assignments. The paper then describes a procedure for developing job performance indices which are required inputs to the man-job matching model described earlier. (Author)

AD-622 008 Div. 23/4 ,30/2
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
ENGINEERING MATHEMATICS VIA COMPUTERS.
Professional paper,
by John Staudhammer. 11 Aug 65, 26p. Rept. no. SP-2176/000/00

Unclassified report

Descriptors: (*Engineering, Mathematics), (*Computer logic, Engineering), (*Education, Engineering personnel), Matrix algebra, Programming (Computers)

The need for extensive efficient use of computers in the engineering curriculum is discussed. An approach is outlined that demonstrably can enhance the understanding of engineering mathematics. The content of, and some of the mechanics of, teaching a course with extensive machine help is described. Results of several offerings of the course are presented. (Author)

AD-622 011 Div. 23/4
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SOME CONSIDERATIONS IN THE EDUCATION OF INDIGENOUS GROUPS IN THE SOUTHWEST.
Professional paper,
by Mark L. Berman. 19 Jul 65, 14p. Rept. no. SP-2148

Unclassified report

Prepared in cooperation with Arizona State Univ., Tempe.

Descriptors: (*Education, United States), Population, Culture, Political science, Economics, Students, California, Nevada, New Mexico, Arizona

Current interest in the educational problems of the indigenous population of the southwestern United States, including Indians and Spanish-speaking peoples, is high. The paper discusses the general size and distribution of these populations in the Southwest. In addition, selected research findings relating to efforts to develop improved methods of dealing with the educational problems of these people are presented. Finally, the applicability of certain educatory techniques, such as programmed instruction, is discussed. (Author)

AD-622 039 Div. 23/1 ,28/4
CFSTI Prices: HC $2.00 MF $0.50
ADJUTANT GENERAL DEPT OF THE ARMY WASHINGTON D C
THE VALIDITY OF OFFICER EFFICIENCY REPORT, WD AGO FORM 67-1 FOR GENERAL OFFICERS,
by G. H. Falk. 13 May 49, 27p. Rept. no. PRS-792

Unclassified report

Descriptors: (*Officer personnel, Selection), Psychometrics, Statistical analysis, Attitudes, Personality, Performance (Human), Tables, Graphics

The demonstrated validities for Form 67-1 in rating general officers are similar to validities of the instrument in rating officers of grade lower than general, when adjustments are made for difference in range of scores for the two groups. Against two different criterion measures, the 67-1 validities were .48 and .46 for brigadier generals, and .39 and .43 for major generals. The validities for the separate parts of the form varied as much as ten points among themselves but approximated the validities of the same parts for officers of lower grades. On the average the general officers scored substantially higher on the instrument than other officers. Conclusions: Form 67-1 is as valid in estimating the efficiency of general officers as in estimating the efficiency of lower grade officers. The general scoring methods used for other grades of officers are usable for general officers as well.

AD-622 042 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
'NOT OFFICER MATERIAL' ATTRITION IN THE NAVAL AIR BASIC TRAINING COMMAND.
Attrition rept. no. 18,
by John T. Bair, and Rosalie K. Ambler. 15 Jul 55, 9p. Rept. no. SR-55-9

Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Officer personnel, Aptitude tests), Flight, Training, Students, Attitudes, Behavior, Performance (Human)

The purpose of this research was (1) to analyze causes of attrition classified as 'not officer material' (NOM), (2) to determine if the present flight aptitude tests are predicting this type of attrition, and (3) to consider this NOM group as research criteria. The results of this research are as follows: (1) NOM cadets differ significantly from successful cadets on only one variable, pre-flight ground final grades, (2) none of the flight aptitude tests are predicting NOM attrition, (3) NOM attrition are the most heterogeneous of any attrition group studied and thus are questionable as homogeneous test research criteria. (Author)

AD-622 050 Div. 23/5 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE RELATION OF PERFORMANCE IN AVIATION TRAINING TO OFFICER QUALITY IN THE FLEET.
Special rept.,
by R. W. Shoenberger. 8 Jun 61, 7p. Rept. no. SR-61-5

Unclassified report

Descriptors: (*Naval training, Aviation personnel), Performance (Human), Intelligence tests, Officer personnel, Personnel selection, Aptitude tests, Intelligence tests, Flight, Training

By means of interviews with squadron commanding officers, fiscal 1958 graduates of the flight training program were identified as being unsatisfactory, satisfactory, or outstanding first tour fleet officers. This report compares these three groups in terms of selection test scores and training grades. Based upon performances on intelligence measures and in academic subjects, it appears that an officer's general intelligence level plays a large part in judgments by others of his officer proficiency during his first tour in the fleet. Flight grades made during training indicate that a man's flight abilities also contribute somewhat to his rating as an officer; however, the data suggest that this contribution is considerably greater in VF-VA squadrons than in VS or VP squadrons. (Author)

AD-622 052 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
FLIGHT FAILURE: POINT OF ATTRITION AND CAUSE.
Special rept.,
by John A. Creelman. 2 Jun 55, 8p. Rept. no. SR-55-7

Unclassified report

Descriptors: (*Naval training, Aviation personnel), Naval personnel, Flight, Training, Learning, Aptitude tests, Students

The purpose of the study was to tabulate by stage the point at which flight failure attrition occurs, and to determine the 'causes' for failure in the stage which has the greatest concentration of failure. It was found that pre-solo stage had the largest percentage of flight failures, and within this stage the reasons most frequently given by SPD Boards were concerned with landings. (Author)

AD-622 059 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF U. S. NAVAL ACADEMY MIDSHIPMEN CRUISES, 1962.
Special rept.,
by Rosalie K. Ambler. 15 Nov 62, 18p. Rept. no. SR-62-7

Unclassified report

Descriptors: (*Naval training, Aviation personnel), Students, Attitudes, Flight, Training

This study was designed to assess the effects of the 1962 air indoctrination cruises for Naval Academy Midshipmen with respect to cruise influence on their attitudes toward aviation and their stated intention of entering flight training. Particular emphasis was given to comparisons with NROTC and other midshipmen groups. The most noteworthy finding in this study was strong evidence that naval aviation has grown in prestige over the last three years among Naval Academy Midshipmen and NROTC students This was evident both before and after the cruises. The remaining findings closely parallel last year's results: (1) The midshipmen's knowledge about and interest in aviation increased after the cruise; (2) there was a significant increase after the cruise in the number who planned to enter aviation after graduation; (3) 'a strong desire to fly' was the principal reason for entering aviation while 'not physically qualified' and 'going subs' were the main reasons for not choosing aviation; (4) about 92 per cent expressed favorable attitudes toward the cruise itself. (Author)

AD-622 060 Div. 23/5 ,5/2
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
EXPERIENCE WITH VOICE COMMUNICATION IN THE TRAINING PROGRAM THROUGH INSTRUMENT PHASE - BTU-4.
Special rept.,
by John W. Black. 31 Aug 56, 10p. Contract N6onr22525 Proj. NR145 993
NSAM , SR-56-23

Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Aviation personnel, Naval training), (*Naval training, Voice communication systems), (*Voice communication systems, Intelligibility), Aircraft, Pilots, Instructors, Students, Speech recognition, Speech transmission

The project was an attempt to ascertain by a questionnaire whether there are important evidences of failure in voice communication in spite of the apparent and important evidence of success that students do complete the Flight Program (e.g., the flight students who completed BTU-4 form the population responding to the questions of the present study). Every student pilot in the small number sampled had experienced imperfect voice communication. The instances cited seemed to be accepted as 'matter of course,' not as instances of imperfect or possibly dangerous operation of an aircraft. The flight instructor seems to be the real instructor in voice communication. (Author)

AD-622 065 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE PROFICIENCY OF FIRST TOUR PILOTS AS INSTRUCTORS.
Special rept.,
by James R. Berkshire. 12 Feb 57, 8p. Rept. no. SR-57-3

Unclassified report

Descriptors: (*Instructors, Pilots), (*Pilots, Instructors), (*Naval training, Aviation personnel), Effectiveness, Psychometrics, Students, Flight

An evaluation was made of the proficiency of the 'plowback' as a flight instructor. The 'plowback,' or first tour instructor, is the aviator who, on graduation from flight training, is reassigned to the Training Command for instructor duty in contrast to an aviator who is being assigned to the fleet for duty.

AD-622 067 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
REVIEW OF THE CURRENT PRE-FLIGHT PHYSICAL FITNESS AND SURVIVAL PROGRAM.
Special rept.,
by David P. Morris,Jr.. 18 Oct 56, 13p. Rept. no. SR-56-24

Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Physical fitness, Naval training), (*Survival, Naval training), Students, Flight, Reviews, Parachute jumping, Exercise

The purpose of the research was to evaluate the present pre-flight physical fitness and survival program and to determine if it were properly oriented to facilitate maintenance of a good level of physical fitness as the student progresses along his naval career. The degrees of physical fitness as observed cadets graduating from pre-flight are good, but the cadet is not motivated nor oriented to maintain a good level of physical fitness. It is recommended that the pre-flight physical fitness and survival program be revised and oriented along lines so that the activities of pre-flight may be carried over in order to maintain a good degree of physical fitness throughout one's naval career.

AD-622 167 Div. 23/1 ,28/4 ,23/5
CFSTI Prices: HC $1.00 MF $0.50
TULANE UNIV NEW ORLEANS LA
SELECTION AND TRAINING.
Final rept.,
by Wilse B. Webb. 2 Apr 56, 8p. Contract Nonr47502 Proj. NR154 098
NAVMED ,NSAM NM001 108 501.8; ,332

Unclassified report

Descriptors: (*Naval personnel, Selection), (*Aviation personnel, Psychometrics), (*Psychometrics, Naval personnel), Leadership, Motivation, Personality, Naval training, Aviation medicine, Aviation accidents, Bibliographies

The research is concerned with the methods of selection and training of Naval aviation personnel. Studies were made of the following: (1) Development of selection measures; (2) Analysis and development of measures of leadership (criterial and selective); (3) Training criterion; (4) Aircraft accidents. A bibliography of the 27 reports published as joint reports with the School of Aviation Medicine in their series of research and special reports is attached.

AD-622 168 Div. 23/1 ,6/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
THE DEVELOPMENT OF METHODS FOR THE SELECTION OF SOUND LISTENING PERSONNEL,
by C. W. Shilling. 1 Mar 42, 11p. Rept. no. MRL-1

Unclassified report

Descriptors: (*Submarine personnel, Selection), (*Underwater sound equipment, Operators (Personnel)), (*Operators (Personnel), Selection), Auditory acuity, Noise, Acoustic equipment, Pitch discrimination, Performance (Human), Audio preception, Aptitude tests, Naval training, Naval personnel

Early in 1939 work was undertaken to determine the effect upon auditory acuity of some of the hazards encountered in the course of submarine duty. It seemed likely that there might be a detrimental effect upon hearing following exposure to conditions such as the continuous roar of diesel

engines, the noise of gunfire, and the mechanical trauma of high pressure air, as in deep-sea diving and lung training. Detailed reports of the results of this work are being published in the U.S. Navy Medical Bulletin, the first section having appeared in the January 1942 number. In the course of this study it was noted that many of the men engaged as sound operators failed to measure up to the auditory requirements of the Manual of the Medical Department, Chapter 11, Article 1535 (d-3), although these same men apparently were capable operators of sound detection equipment. This led us to question the use of the audiogram as the sole means of selecting sound operators. An attempt was therefore made to discover tests which might better serve this purpose.

AD-622 169 Div. 23/1 ,16/15
CFSTI Prices: HC $2.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
THE DETERMINATION OF NIGHT VISION OF SUBMARINE PERSONNEL.
25 Apr 42, 33p. Rept. no. MRL-2
Proj. X-49

Unclassified report

Descriptors: (*Vision, Adaptation (Physiology)), (*Submarine personnel, Vision), Naval personnel, Medical examination, Training, Ships, Identification, Training devices, Determination, Visual perception, Medical equipment, Retina

AD-622 170 Div. 23/1 ,16/15,23/5
CFSTI Prices: HC $2.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
FURTHER REPORT ON THE TESTING OF EFFICIENCY OF NIGHT VISION: COMPARATIVE RELIABILITY AND VALIDITY MEASURES ON THE ADACTOMETER AND THE SELF-LUMINOUS TELE-SILHOUETTE ADAPTOMETER,
by Lynn S. Beals,Jr.. Jan 43, 36p. Rept. no. MRL-14

Unclassified report

Descriptors: (*Vision, Adaptation (Physiology)), (*Medical equipment, Reliability), Medical examination, Naval personnel, Meters, Brightness, Training devices, Tests, Illumination

An extensive experimental test was conducted on the following adaptometers: Beals Adactometer; Selfluminous tele-silhouette, as revised at the U. S. Submarine Base, New London, Conn.; Hecht-Shlaer portable Adaptometer, Royal Canadian Navy Model. The data obtained permit comparison of the three instruments with respect to test-retest reliability. Intercorrelations are presented, together with correlations with several other possibly significant variables. There are now available several adaptometric procedures and instruments which yield scores of satisfactory reliability. None of these, however, were validated. The most pressing need at the present time is for the setting-up of procedures which may settle the question of the validity of the various instruments and methods which satisfy the requirements with respect to reliability. I. Q. and 'emotional stability', as they are usually determined, are of no consequence in the testing of the night vision of normal populations. (Author)

AD-622 171 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
TEST-RETEST RELIABILITY OF THE ADMIRALTY MARK I ADAPTOMETER,
by W. S. Verplanck, and D. T. Reed. Feb 43, 5p. Rept. no. MRL-16

Unclassified report

Descriptors: (*Medical equipment, Reliability), (*Vision, Medical examination), Submarine personnel, Performance tests, Adaptation (Physiology), Naval personnel, Meters

The subjects employed were 27 enlisted men awaiting the start of the next class at the Basic Submarine School. Throughout the period of the experiment, these men were rerestricted and were instructed to get normal sleep, so that the factors of alcohol and fatigue might be controlled. Fourteen of these men received their first test in the morning and thirteen in the afternoon. Their retest took place 48 hours after the original test. The order in which the men were tested was constant. The results indicate that the reliability of scores is somewhat lower than of scores made by comparable subjects on other adaptometers.

AD-622 172 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
THE TEST-RETEST RELIABILITY OF THE MILES FOUR-PLAQUE ADAPTOMETER,
by W. S. Verplanck, and D. T. Reed. 1943, 6p. Rept. no. MRL-17

Unclassified report

Descriptors: (*Medical equipment, Reliability), (*Vision, Medical examination), Adaptation (Physiology), Meters, Brightness, Naval personnel, Submarine personnel, Rotation

The adaptometer is a simplifier arrangement for the direct presentation in varying positions of rotation of four self-luminous stimuli which vary in brightness over a total range of .9 log uuL units. Results of tests on this adaptometer indicate that the test-retest reliability of scores is lower than that of scores made by comparable subjects on other adaptometers.

AD-622 173 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
A RAPID PROCEDURE FOR TESTING OF NIGHT VISION,
by William S. Verplanck. 5 Mar 43, 18p. Rept. no. MRL-19

Unclassified report

Descriptors: (*Vision, Adaptation (Physiology)), (*Naval personnel, Selection), Brightness, Medical examination, Visual acuity, Submarine personnel, Performance tests

A procedure for the routine testing of large populations of men in night vision is proposed. Data, obtained in previous experiments, are presented which indicate that the proposed method will yield results satisfactory for the purposes. The method calls for testing at a single relatively high brightness level with consequent spread of the lower 20-25% of the population, who are to be retested before final qualification or disqualification for duties at night is reported. This method, it is believed, will permit more rapid, more reliable, and more satisfactory selection of men with respect to night vision. (Author)

AD-622 174 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
NIGHT VISION TESTING OF MEMBERS OF THE CREW OF THE U.S.S. NEW JERSEY; INCIDENTAL DATA OF INTEREST,
by William S. Verplanck. 1943, 13p. Rept. no. MRL-21

Unclassified report

Descriptors: (*Vision, Adaptation (Physiology)), (*Naval personnel, Vision), Medical examination, Battleships, Visual acuity, Performance tests, Reliability, Statistical data

In the course of testing 826 men on the crew of the U.S.S. New Jersey, certain data of interest were obtained incidentally. These results are presented. The data make possible evaluation of the test procedure employed, and permit suggestions for improvement in the testing method in the interest of obtaining more satisfactory results. (Author)

AD-622 175 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
TEST-RETEST RELIABILITY OF THE WRIGHT ADAPTOMETER,
by W. S. Verplanck, and D. T. Reed. 1943, 5p. Rept. no. MRL-18

Unclassified report

Descriptors: (*Medical equipment, Reliability), (*Vision, Medical examination), Naval personnel, Submarine personnel, Performance tests, Meters, Adaptation (Physiology)

The subjects employed were 27 enlisted men awaiting the start of the next class at the Basic Submarine School. Throughout the period of the experiment, these men were restricted, and were instructed to get normal sleep, so that the factors of alcohol and fatigue might be controlled. Fourteen of these men received their first test in the morning and thirteen in the afternoon. Their retest took place 48 hours after their original test. The order in which the men were tested was constant. The results indicate that the reliability of scores on the Wright Adaptometer made by the subjects is well below that of scores made by comparable subjects on other adaptometers.

AD-622 176 Div. 23/1 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
RELIABILITY COEFFICIENTS AND INTER-CORRELATION COEFFICIENTS FOR PERSONNEL SELECTION TESTS AT THE U. S. SUBMARINE BASE, NEW LONDON, CONNECTICUT,
by Neil R. Bartlett. 9 Sep 43, 4p. Rept. no. MRL-26

Unclassified report

Descriptors: (*Psychometrics, Reliability), (*Submarine personnel, Selection), Naval personnel, Correlation techniques

The report presents reliability coefficients for the Personal Inventory, New London N.D.R.C. Confidential Inventory (Form H) and an adaptation of the NRC Form R-2. Scoring stencils utilized for these tests are, respectively, the unweighted Personal, H-I and the unweighted R-2 Analysis. Intercorrelation coefficients are reported.

AD-622 177 Div. 23/5 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
NIGHT LOOKOUT TRAINING AND TESTING DEVICE DEVELOPED AT THE UNITED STATES SUBMARINE BASE NEW LONDON, CONNECTICUT.
16 Sep 42, 11p. Rept. no. MRL-8

Unclassified report

Descriptors: (*Training devices, Vision), (*Vision, Adaptation (Physiology)), (*Naval personnel, Visual perception), Ship models, Submarine personnel, Ship hulls, Determination, Night warfare, Identification

Briefly, the device and method employed reproduces in a testing room the situation confronting the lookout. A realistic horizon, simulating an arc of 90 degrees from dead ahead to 45 degrees on port and starboard bows, is provided upon which the trainee is required to sight and identify ship models. The apparatus provides also for reproduction of distant gunfire, of moonlight, and of recognition lights. Its advantages as a training and testing device lie in its realism, and in the interest which it arouses in the men. Throughout the period

that tests of night vision employing the artificial horizon were conducted, the procedure was held constant. It proved remarkably satisfactory for the dual purpose of instruction and testing.

AD-622 179 Div. 23/1 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
NEUROPSYCHIATRIC MISFITS SCREENED BY THE PERSONAL INVENTORY AND BY THE NEW LONDON N. D. R. C. CONFIDENTIAL QUESTIONNAIRE,
by Neil R. Bartlett. 1 Nov 43, 7p. Rept. no. 29
Unclassified report

Descriptors: (*Neuroses, Psychometrics), (*Psychiatry, Psychometrics), Selection, Neurology, Personality, Naval personnel, Submarine personnel

Data are presented indicating that, for either of the above tests, at least two-thirds of the early service neuropsychiatric discharges obtain scores in the range which includes ten percent of the total population. Psychiatric classifications for a population of candidates for Submarine School scoring in the highest eleven percent for the Personal Inventory and for the highest ten percent for each of the two component parts of the New London Questionnaire are tabulated, and it is noted that such populations are heavily loaded with inferior material. For example, of 204 men obtaining scores 15 and above on the Personal Inventory, 115, or 56%, are classified as either 'extremely questionable' or 'recommended for disqualification'. Those persons considered primarily as intellectually deficient are not involved in these data. To compare with this percentage it is observed that of the total population examined at New London during 1942, 23% were so classified. Two personnel selection inventories are evaluated according to their individual success in identifying those persons of the enlisted population whom psychiatrists judge to have a bad prognosis. (Author)

AD-622 180 Div. 23/1 ,16/15
CFSTI Prices: HC $2.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
COLOR VISION TESTING.
Preliminary rept.
12 Sep 42, 33p. Rept. no. MRL-7 vol. 1 ,Color vision-1
Proj. V5 2
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. A copy is available for public sale.

Descriptors: (*Color vision, Medical examination), Naval personnel, Civilian personnel, Submarine personnel, Colors, Visual acuity, Performance tests, Optical equipment, Medical equipment, Statistical analysis

Research was conducted using the following equipment: (1) The Pseudo-Isochromatic plates manufactured by The American Optical Company. (2) The Royal Canadian Navy Colour Vision lantern, (3) The Farnworth panel, (4) The Inter-Society Color Council Series 4-A 'designed for testing color blindness', (5) The Edridge-Green Lamp, (6) The Vision Color Test Wools, and (7) The Jensen chart. The subjects for this study are drawn from three sources: (1) the U.S. Navy men who are candidates for Submarine School reporting for physical examination, (2) the civilians who are candidates for enlistment in the Marine Corps and are having their preliminary examination at the Submarine Base Dispensary. (3) the civilians who are canadidates for Civil Service appointments and are reporting for physical examination at the U.S. Naval Submarine Base Dispensary.

AD-622 181 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
TRIAL OF ROYAL CANADIAN NAVY COLOUR VISION LANTERN IN COMPARISON WITH OTHER TESTS OF COLOR VISION,
by C. W. Shilling. 18 Jan 43, 23p. Rept. no. MRL-15 vol. 2 ,Color vision-2
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-622 180.

Descriptors: (*Color vision, Medical examination), (*Medical equipment, Tests), Training, Operation, Illumination, Analysis, Naval personnel, Colors, Visual acuity

Advantages of the Royal Canadian Lantern appear to be: (1) Simplicity of administration. Little training necessary. Results not influenced by individual operators whereas the Edridge-Green lantern requires considerable training and is difficult to administer. (2) Short test -- approximately 1 1/2 minutes per normal individual. (The American Optical Company (A-O) plates complete -- 1 1/2 + 3 minutes; Edridge-Green complete -- 3+ minutes). (3) Simple to interpret and to score. Coaching or previous training has minor influence on results of lantern but marked influence on results of A-O plates. (4) Permits positive interpretation. (5) No special lighting required, therefore can always be given under standard conditions. A-O plates are seldom given under standard conditions, with consequent wide variance in results. (6) Less exacting in selection than A-O plates given and scored in accordance with existing instructions.

AD-622 182 Div. 23/1 ,16/15
CFSTI Prices: HC $2.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
FIELD TESTS OF THE RADIUM PLAQUE ADAPTOMETER,
by W. S. Verplanck. 26 Nov 43, 30p. Rept. no. 33
Unclassified report

Descriptors: (*Medical equipment, Tests), (*Vision, Medical examination), Naval personnel, Submarine personnel, Performance tests, Meters, Adaptation (Physiology), Performance (Engineering), Reliability, Radium

Two Radium-Plaque Adaptometers underwent extensive tests during routine use at the U. S. Submarine Base. A report is submitted on their mechanical characteristics, their properties as testing devices, and on the practicability of the procedure prescribed. The Radium-Plaque Adaptometer as delivered may be improved mechanically. Mechanical considerations aside, the Adaptometer is satisfactory as a testing device. However, addition of an intermediate filter may be expected to improve its performance in the testing of difficult subjects. For the proper development of the necessary skill in testing personnel, supervised instruction of operators is essential. Modifications in the instruction manual are proposed. (Author)

AD-622 183 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
A SURVEY OF METHODS USED IN ADMINISTERING PSEUDO-ISOCHROMATIC TEST PLATES FOR COLOR VISION,
by Dean Farnsworth. 6 Nov 43, 18p. Rept. no. Color vision-3
Unclassified report

See also AD-622 181.

Descriptors: (*Color vision, Medical examination), Naval personnel, Performance tests, Colors, Medical equipment, Submarine personnel

The object of this investigation was to find the errors in administration of the pseudo-isochromatic plates which had contributed to the unreliability of the previous tests. The data were obtained by interview with 27 applicants who had passed their physical examinations for Submarine Service but failed a brief, properly administered screening test for color vision at the Submarine Base. As generally administered and interpreted in the Navy the A. O. test is concluded to be unreliable and largely ineffective as a test for color vision.

AD-622 184 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
SUMMARY AND CONCLUSIONS, EXTRACT FROM: EXAMINATION OF THE WILLIAMS LANTERN AS A TEST FOR COLOR VISION,
by Dean Farnsworth. 22 Nov 43, 3p. Rept. no. 31 v2-n18 ,Color vision-6
Unclassified report

See also AD-622 220.

Descriptors: (*Color vision, Medical examination), (*Medical equipment, Tests), Performance tests, Naval personnel, Selection, Light, Colors, Operation

The Williams Lantern was tested on 75 normals and 25 color deficients, using a variety of combinations of size of apertures, numbers of light filters and brightnesses. The total number of judgments was 12,600. Tests were conducted in dark and in light surroundings. Defective color vision of the observers was scored by using four or more standard tests for color vision: Pseudo-isochromatic tests, Dimmick Anomaloscope, Royal Canadian Navy Lantern, and Farnsworth Dichotomous Test B-20. Scores were difficult to interpret. Normal observers and moderately color deficient observers made similar responses. Such interpretations as were possible correlated poorly with present standard tests. The machine was found awkward and confusing to operate. (Author)

AD-622 185 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
THE EFFECT OF CERTAIN ILLUMINANTS ON SCORES MADE ON PSEUDO-ISOCHROMATIC TESTS,
by Dean Farnsworth, J. D. Reed, and C. W. Shilling. 22 Nov 43, 13p. Rept. no. 32 v2 ,Color vision-4
Unclassified report

See also AD-622 183.

Descriptors: (*Color vision, Medical examination), (*Illumination, Color vision), Performance tests, Colors, Naval personnel, Light, Medical equipment

The selection of pseudo-isochromatic plates and the interpretation of the scores have been decided from studies made under standard illuminants. However, color tests in the Navy are administered under a wide variety of lighting conditions. The color temperature of a number of these illuminants was measured, and two test lights were selected which represented diverse parts of the color-illuminant range: one, yellowish incandescent light, the other, standard mixed daylight. An abridged set of A.O. Plates was given to a test group under these two lights. Present acceptance-rejection standards are invalid when pseudo-isochromatic plates are administered under non-standard illumination. The administration of the plates under yellowish light-natural or incandescent--tends to cause rejection of protanomalous and acceptance of deuteranomalous applicants.

AD-622 186 Div. 23/1 ,28/4
CFSTI Prices: HC $1.00 MF $0.50

NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

THE RELATIONSHIP OF SCORES ON FORM 3, OFFICER QUALIFICATION TEST, TO GRADES IN THE OFFICERS' SUBMARINE SCHOOL, NEW LONDON, CONNECTICUT,

by Neil R. Bartlett. 22 Nov 43, 3p. Rept. no. 32a

Unclassified report

Descriptors: (*Officer personnel, Psychometrics), (*Submarine personnel, Selection), Naval personnel, Students, Correlation techniques

Form 3 of the Officer Qualification Test was administered to the candidates reporting to the Submarine Base, New London, for the current class in Officers' Submarine School. The mean and standard deviations for this group are reported, and it is noted that there is a correlation of +0.404 between test scores and Submarine School grades. (Author)

AD-622 187 Div. 23/5 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

NIGHT LOOKOUT TRAINING SCHOOL.

9 May 42, 14p. Rept. no. MRL-3

Unclassified report

Descriptors: (*Naval training, Training devices), (*Training devices, Vision), Medical equipment, Medical examination, Visual acuity, Naval personnel, Ship models, Warning systems, Blindness, Meters

The apparatus employed for night lookout training at the U. S. Submarine Base, New London, Connecticut, is described. The procedure employed in its use is given in detail, together with the results which have been obtained to date. It is concluded that this device is of great value for training; however, it cannot, as yet, be used in the accurate determination of efficiency of night vision. (Author)

AD-622 212 Div. 23/1 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

DESIGN OF A METHOD FOR RECORDING MEDICAL DATA SIGNIFICANT IN MEDICAL EXAMINATIONS FOR SUBMARINE SCHOOL CANDIDATES IN ORDER TO PERMIT RAPID ANALYSIS BY PUNCH CARD TECHNIQUES.

Progress rept. no. 2,
by T. L. Willmon, and N. R. Bartlett. 25 Oct 44, 5p. Rept. no. MRL-47
Proj. X247

Unclassified report

Descriptors: (*Medical examination, Data storage systems), (*Punched cards, Data processing systems), (*Information retrieval, Personnel management), (*Submarine personnel, Personnel management), Students, Psychometrics, Selection, Design, Analysis, Naval personnel, Vision, Hearing

Some trends in the physical and psychological characteristics of enlisted candidates for the Submarine School, New London, Connecticut are reported. These trends are revealed by analyses of International Business Machine cards punched in accordance with the technique outlined in AD-622 216. A marked improvement in certain psychological characteristics is noted. There was an increase in the number of men failing standards for visual and auditory sensitivity. Motivation and physical examination data (exclusive of auditory and visual function) show no significant trend. (Author)

AD-622 214 Div. 23/1 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

INTERCORRELATIONS OF NDRC SELECTION TESTS, AND CORRELATIONS OF THESE TESTS WITH THE APTITUDE SCORES RECORDED ON THE ENLISTED PERSONNEL QUALIFICATIONS CARD,

by N. R. Bartlett. 29 Aug 44, 4p. Rept. no. MRL-46
Proj. X242

Unclassified report

Descriptors: (*Psychometrics, Correlation techniques), (*Naval personnel, Selection), Submarine personnel, Tables, Personality, Achievement tests, Performance tests

A table of correlation coefficients is presented to show the interrelationships of certain NDRC selection tests to each other and to scores for tests of the basic battery. It is noted that the coefficients are low; thus the NDRC tests probably involve factors that are not related to those measured by the basic battery of Bureau of Personnel tests. Data are presented showing the correspondence between the Otis Intelligence and Navy General Classification Tests. (Author)

AD-622 215 Div. 23/1 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

COMPARISON OF RESULTS OBTAINED ON THE EXPERIMENTAL FORM OF THE OFFICER MECHANICAL APTITUDE TEST, FORM X-1 (NAVPERS-16640) WITH (1) RESULTS ON THE OFFICER QUALIFICATION TEST, FORM 3, (NAVPERS-16563) AND (2) GRADES IN SUBMARINE SCHOOL,

by N. R. Bartlett. 9 Aug 44, 6p. Rept. no. MRL-43
Proj. X382

Unclassified report

Descriptors: (*Psychometrics, Correlation techniques), (*Officer personnel, Selection), (*Submarine personnel, Selection), Aptitude tests, Students, Achievement tests

Means and standard deviations of test scores are reported for a population of commissioned candidates for submarine school. Correlation coefficients showing the relationship of the scores to each other and to submarine school grades are presented. It is noted that of the various sections of these tests, those on arithmetic reasoning and mechanical comprehension yield the largest coefficients. The population on which the report is based is a somewhat selected sample of junior commissioned officers. The study was undertaken in order to determine the interrelationship of certain selection devices and the success of those devices in predicting grades in submarine school. The choice of tests was governed by previous decisions on the proposed content of the Officer Classification Test; both scales discussed are incorporated in modified form in this new instrument.

AD-622 216 Div. 23/1 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

DESIGN OF A METHOD FOR RECORDING MEDICAL DATA SIGNIFICANT IN MEDICAL EXAMINATIONS FOR SUBMARINE SCHOOL CANDIDATES IN ORDER TO PERMIT RAPID ANALYSIS BY PUNCH-CARD TECHNIQUES,

by T. L. Willmon, and N. R. Bartlett. 1 May 44, 13p. Rept. no. MRL-40
Proj. X247

Unclassified report

Descriptors: (*Medical examination, Data storage systems), (*Punched cards, Data processing systems), (*Information retrieval, Personnel management), (*Submarine personnel, Personnel management), Students, Naval personnel, Design, Records, Selection, Analysis, Psychometrics

An IBM punch-card personnel accounting system to furnish information for medical and personnel selection officers is described. The system was developed to suit the needs of a particular service school situation; the report was prepared in order to demonstrate one approach for dealing with personnel data, and it is emphasized that other situations may require a completely different design. (Author)

AD-622 217 Div. 23/1 ,16/15,23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

FIVE HUNDRED SUBJECTS TESTED AND RETESTED FOR FIFTY TRIALS EACH ON THE NAVY RADIUM PLAQUE ADAPTOMETER.

Research rept.,
by R. H. Peckham, and W. S. Verplanck. 8 Mar 44, 7p. Rept. no. MRL-38
Proj. X268Av156c
NAVMED , X-268 (Av-156-c)

Unclassified report

Descriptors: (*Medical equipment, Analysis), (*Vision, Medical examination), Naval personnel, Submarine personnel, Meters, Adaptation (Physiology), Performance tests, Radium, Statistical analysis, Training devices, Instructors, Selection

Over five hundred men were tested and retested for fifty trials each on the Navy Radium Plaque Adaptometer at the U. S. Submarine Base, New London, Connecticut by pharmacists in training as instructors in the use of this adaptometer. The subjects were personnel of the New London Submarine Base. It was found that the following scores could be successfully used as critical scores. (1) 10 out of 10. 16 out of 20 or better equals 'PASS'. (2) 15 out of 20 or less equals 'FAIL'. It was found that the addition of thirty trials giving a total of fifty trials would not improve materially the classification at a single sitting. It was recommended that these scores be used for classification of the two groups, 'pass' and 'fail'. The statistical analysis of scores of this type show that a doubtful group cannot be accurately classified in as much as fifty trials. For this reason, the doubtful or intermediate category is recommended for omission. (Author)

AD-622 219 Div. 23/1 ,28/4 ,23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

DEVELOPMENT OF A METHOD FOR OBTAINING PERSONAL PREFERENCES FROM WITHIN SMALL GROUPS, AND THE RELATIONSHIP OF SUCH EVALUATIONS TO OTHER PSYCHIATRIC AND PSYCHOLOGICAL DATA,

by B. E. Wiggin, and N. R. Bartlett. 25 Jan 44, 8p. Rept. no. MRL-36
Proj. X246

Unclassified report

Descriptors: (*Group dynamics, Psychometrics), (*Submarine personnel, Psychometrics), Training, Psychiatry, Correlation techniques, Personality, Correlation techniques, Personality, Public opinion, Decision making, Students, Naval personnel

The personal preference technique employs instead the opinions of many who are not expert, but who have had opportunity for more adequate observation of each other than is ever possible for an instructor. The technique was investigated for its feasibility as a supplement to instructors' grades.

AD-622 220 Div. 23/1 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

THE EFFECT OF CHANGING THE ILLUMINATION ON THE COLORS IN PSEUDO-ISOCHROMATIC PLATES,

by Dean Farnsworth, and J. D. Reed. 3 Jan 44, 16p. Rept. no. MRL-35 Color vision-5

Unclassified report

See also AD-622 185.

Descriptors: (*Color vision, Medical examination), (*Illumination, Colors), Medical equipment, Performance tests, Light, Naval personnel, Selection

The effect of illumination in changing the relationships between colors is discussed. Particular reference to this change is made concerning color blinds and how their responses to pseudo-isochromatic tests will differ under different lighting conditions. Finally, the application of these conclusions to a particular plate in the present Navy test is shown. Non-standard illumination has the following effects: (1) The intended relationships in the tests no longer hold. (2) The degree of stringency of the test is altered. (3) Under incandescent illumination the test becomes much easier for deuteranomalous observers, and less easy for protanopes. (Author)

AD-622 293 Div. 23/5 ,28/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY HOSPITAL WEST POINT N Y
PRETRAINING CORRELATES OF TRAINFIRE MARKSMANSHIP.
Technical rept. on Medical Research Proj.,
by David P. Vielhaber, and Carl G. Lauterbach.
Jan 65, 14p. Rept. no. TR-17
Contract OTSG6 60 10 016

Unclassified report

Descriptors: (*Army training, Gunnery), Military psychology, Attitudes, Motivation, Behavior, Performance (Human), Army personnel, Small arms

Entering USMA cadets of the Class of 1967 were studied to determine whether prior weapons experience, intelligence, or their parents' or their own attitudes toward weapons influenced their subsequent rifle firing scores in a 'Trainfire' marksmanship course. On a questionnaire administered shortly after arrival at West Point, 59 per cent reported they had fired at least 250 shots previously, and 40% had a prior course of instruction. Virtually all (98%) expressed a liking for weapons, and 73% reported they expected to fire in the upper half of their class. Most (82%) reported their fathers as either in favor of, or not objecting to, their use of firearms, and 43% reported their fathers had bought them weapons. Mothers were less encouraging than fathers regarding owning and using firearms; however, 71% of the subjects described their mothers as either encouraging or not objecting to their learning to fire weapons. A cadet's expressed confidence in his firing ability was found to be a limited, yet the best, single predictor of his range firing scores. Although items concerning prior firing experience, and items concerning cadet and parental attitudes toward weapons, were also correlated with the criteria of range firing scores, they did not add substantially to the predictive ability of the confidence item. The correlations of experience with range scores were lower than in previously reported studies. Intelligence, which was correlated with marksmanship scores of Army basic trainees, was not found to be an effective predictor in this cadet population. (Author)

AD-622 294 Div. 23/5
CFSTI Prices: HC $2.00 MF $0.50
ARMY HOSPITAL WEST POINT N Y
THE EDUCATIONAL CLIMATE AT WEST POINT AS REPORTED BY FIRST AND FOURTH CLASS CADETS.
Technical rept. on Medical Research Proj.,
by Carl G. Lauterbach, and David P. Vielhaber.
Mar 65, 34p. Rept. no. TR-18
Contract OTSG6 60 10 016

Unclassified report

Descriptors: (*Military facilities, Education), (*Army training, Public opinion), Army personnel, Students, Military psychology, Adjustment (Psychology), Perception (Psychology)

The purpose of the study was to systematically explore views of the West Point educational environment held by two United States Military Academy cadet groups, First Classmen and Fourth Classmen. The College Characteristics Index (CCI), a well standardized inventory of the intellectual and non-intellectual climate of collegiate environments, was administered to 172 First Class cadets (Class of 1960) in March 1960 and to 646 Fourth Class cadets (Class of 1963) in December 1959. The two groups reported the same general profile of the West Point environment on the 30 scales of the CCI. In contrast, the West Point profile was sharply distinctive from profiles available for upperclassmen from other college level institutions. Despite having the same general pattern of views of the educational environment at West Point, the First Class and Plebe cadet groups differed reliably in their responses to many individual CCI scales and statements. Certain necessary qualifications against comparisons of West Point with non-West Point groups on the CCI were emphasized. The report presents one method of summarizing the cadets' views of the West Point environment. It is derived from actual CCI items on which both groups had a high degree of consensus (80% agreement). (Author)

AD-622 295 Div. 23/5 ,28/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY HOSPITAL WEST POINT N Y
FIRST IMPRESSIONS AND SUBSEQUENT RATINGS OF PERFORMANCE.
Technical rept.,
by David P. Vielhaber, and Edward Gottheil.
May 65, 11p. Rept. no. TR-19
Contract OTSG6 60 10 016

Unclassified report

Descriptors: (*Army personnel, Performance (Human)), (*Military psychology, Army personnel), Aptitude tests, Personality, Attitudes, Officer personnel

The study was concerned with the relationships between first impressions and later ratings. It sought to determine whether the initial impressions newly arrived West Point cadets make on others are related to later ratings of their performance, including the Aptitude for Service Rating (ASR) which is a composite of ratings by peers and superiors. On the basis of brief observations, four officers rated a sample of 117 incoming cadets on a 12-item Appearance Rating Scale. In addition, on separate single items they attempted to predict the cadets' subsequent grades, demerits, and ASR. Agreement among the raters on the Appearance Rating Scale tended to be low (interrater reliabilities from .14 to .58). Nevertheless, combined ratings (means) of the four raters on the Appearance Rating Scale were significantly correlated with later ASR (r= .31) and with early and late ratings of performance during New Cadet Barracks (r = .25 and r = .38). On the single Aptitude Predictor item the pooled judgments of the raters were predictive of ASR (r = .34) only somewhat less than upperclassmen's ratings of New Cadens' duty performance after four weeks of close observation (r = .45). The raters failed to predict demerits or grades with single-item predictors of these criteria. Regardless of the low reliability among raters, this study suggests that appearance, as measured by the initial impressions one makes on others, is related to later peer ratings. (Author)

AD-622 296 Div. 23/5 ,28/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY HOSPITAL WEST POINT N Y
PERSONALITY-LEADERSHIP CORRELATES OF TRAINFIRE MARKSMANSHIP OF NEW WEST POINT CADETS.
Research rept.,
by Carl G. Lauterback, and David P. Vielhaber.
Aug 65, 16p. Rept. no. RR-20
Contract OTSG6 60 10 016

Unclassified report

Descriptors: (*Army training, Gunnery), (*Psychometrics, Army personnel), Personality, Leadership, Military psychology, Emotions, Anxiety, Performance (Human)

The study sought to determine whether personality attributes of USMA cadets (as measured by Cattel's 16 PF and Heineman Manifest Anxiety Scale) were related to their rifle marksmanship proficiency, and whether these relationships differ among novice and experienced firers. Experienced group scored higher in Emotional Maturity, Dominance, Adventurousness, and Sophistication, and lower in Apprehensiveness and Anxiety than novice group. Personality traits were found to be unrelated to rifle performance among experienced firers; however, several traits were found to be related to performance among novice firers. It is suggested that experience with weapons protect against personality traits affecting performance. Confidence in firing ability (predicted score) was unrelated to personality traits among experienced firers, who presumably base prediction on experience. Among novice firers, however, confidence in ability was related to a number of personality traits. (Author)

AD-622 297 Div. 23/5 ,28/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY HOSPITAL WEST POINT N Y
AN EFFORT TO IDENTIFY STRESS-PRONE AND STRESS-RESISTANT CADETS.
Research rept.,
by Carl G. Lauterbach, and David P. Vielhaber.
Aug 65, 6p. Rept. no. RR-21
Contract OTSG6 60 10 016

Unclassified report

Descriptors: (*Army personnel, Stress (Psychology)), (*Military psychology, Army personnel), Gunnery, Small arms, Army training, Anxiety, Performance (Human), Reaction (Psychology)

In an effort to identify cadets who are stress-prone and stress-resistant, attempts were made to introduce certain experimental stresses while New Cadets were firing on the rifle range. In addition, the relationship between anxiety and performance during the normally occurring stress of Record Firing was investigated. A thorough analysis of the results failed to indicate that the attempts to introduce stress had been effective, or that reaction to the stress of Record Firing was related to anxiety. Therefore, there was no basis on which to classify cadets as stress-prone or stress-resistant. It is suggested that cadets may be generally stress-resistant, or that they were simply unaffected, to the relatively mild stresses used in the study. (Author)

AD-621 847 See Fld. 5/1

AD-622 062 See Fld. 1/2

AD-622 188 See Fld. 5/10

AD-622 189 See Fld. 5/10

AD-622 231 See Fld. 5/10

5/10. PSYCHOLOGY (INDIVIDUAL AND GROUP BEHAVIOR)

AD-621 639 Div. 28/4 ,30/2
CFSTI Prices: HC $2.00 MF $0.50
PRINCETON UNIV N J DEPT OF PSYCHOLOGY
AN IBM 7090-94 PROGRAM FOR A COMPLETE PAIRED COMPARISON SCHEDULE, WITH FORTRAN LISTING AND TRIAL DATA.
Technical rept., appendix,
by Harold Gulliksen, Dorothy P. Gulliksen, and

Mary Bowen. Jul 65, 42p. Contract Nonr185815 Grant ,NSF GB3402 Proj. NR150 088

Unclassified report

Descriptors: (*Programming (Computers), Factor analysis), (*Psychometrics, Programming (Computers)), Reliability, Analysis of variance, Programming language, Scheduling

This IBM 7090-94 program was designed to analyze paired comparison data with or without an absolute judgment set of data. The maximum number of stimuli is equal to 70; the maximum subjects in one study is 99999. This program computes the frequency matrix (KFREQ), the matrix of proportions (P), the normal transform (HN), the arcsin transform (HA-ARCSIN (2*P-1)), the logistic transform (HL=LOG (P/ (1-P))), the scale values for all 3 transforms, estimates of the arcsin from the normal and logistic scale values, and an analysis of variance and reliabilities for the estimates. The main part of the questionnaire consists of the pairs of objects to be judged by the subject, who is asked to put a cross next to the object of the pair which is preferred or favored in reference to some designated characteristic. Following this main section there may follow an absolute judgment (Like-Dislike) section of the questionnaire which consists of the list of K objects. The subject is asked to check each object as to whether he likes (favors) or dislikes (does not favor) the object when considered in reference to the same designated characteristic. A checking program is included with an output identifying certain types of errors. There are about 7939 (decimal) words not used in the program.

AD-621 647 Div. 28/1 ,30/5
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
CYBERNETICS AND PSYCHOLOGY.
Summary of data.
20 Sep 65, 46p. Rept. no. ATD-P-65-78 ,1 TT , 65-64024

Unclassified report

Rept. on Surveys of Communist world scientific and technical literature.

Descriptors: (*Cybernetics, Bibliographies), (*Speech recognition, Bibliographies), Psychochemical agents, Sleep, Learning, Abstracting, Psychology

A bibliography with summaries is given on biocybernetics, speech recognition, psychochemicals, and hypnopedia.

AD-621 763 Div. 28/3
PRINCETON UNIV N J BEHAVIORAL SYSTEMS LAB
FORCE DIFFERENTIATION IN HUMAN SUBJECTS.
Technical rept.,
by Donald E. Mintz, and Joseph M. Notterman.
1965, 3p. Rept. no. TR-7
Contract Nonr185819

Unclassified report

Pub. in Psychon. Sci. v2 p289-90 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Motor reactions, Performance tests), Force (Mechanics), Psychophysiology, Visual perception, Reaction (Psychology), Learning

Force of response was differentiated in four human Ss using a quantitative visual feedback procedure. Variations in the force required produced systematic changes in rate of response and in the precision with which the response was made. (Author)

AD-621 764 Div. 28/3
PRINCETON UNIV N J BEHAVIORAL SYSTEMS LAB
RESPONSE FORCE AS A FUNCTION OF AMOUNT OF REINFORCEMENT.
Technical rept.,
by Vincent Di Lollo, W. D. Ensminger, and J. M. Notterman. 29 Dec 64, 7p. Rept. no. TR-8
Contract Nonr185819

Unclassified report

Pub. in Journal of Experimental Psychology v70 n1 p27-31 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Motor reactions, Conditioned reflex), (*Reaction (Psychology), Motivation, Force (Mechanics), Performance tests, Rats

Five groups of 6 rats each were trained to press an isometric lever and were rewarded with either 1, 2, 3, 4, or 5 20-mg. pellets on responses meeting or exceeding an 8-gm. force criterion. After 10 Acquisition sessions all Ss were shifted to 3 pellets for 6 further sessions and then received 2 Extinction sessions. Both force and variability of bar pressing varied inversely with amount of reward by the end of Acquisition, but not during Shift or Extinction. An account of these results in terms of criterion discrimination is suggested. (Author)

AD-621 889 Div. 28/1
CFSTI Prices: HC $3.00 MF $0.75
PRINCETON UNIV N J BEHAVIORAL SYSTEMS LAB
DYNAMICS OF THE ESCAPE RESPONSE.
Technical rept. (Doctoral thesis),
by Michael Leffand. Jun 65, 91p. Rept. no. TR-6
Contract Nonr185819

Unclassified report

Descriptors: (*Conditioned reflex, Behavior), Monkeys, Motivation, Reaction (Psychology), Motor reactions, Heat, Temperature, Body weight

The purpose of this study was to examine the force of escape responses under two levels of aversive heat and with different minimum response force requirements. It has been shown that force is a lawful response measure under positive reinforcement (Notterman and Mintz, 1965). Subjects will adjust force emission to reinforcement contingencies, and force is affected by size of reward and level of motivation. Three squirrel monkeys were run under six response force criteria (force required for reinforcement) : 3, 10, 20, 30, 50, and 10 grams, in that order, for 12 days at each criterion. Two levels of aversive heat were alternated daily on an ABBA order. The subject could turn off the aversive heat for 60 seconds by emitting a response above the specified criterion. Response force was recorded for all responses, as well as latency from heat onset to the first response. It was concluded that response force in an escape situation is a lawful response measure, and that it operates in a manner similar to force under positive reinforcement.

AD-621 914 Div. 28/1 ,16/12
CFSTI Prices: HC $3.00 MF $0.75
MICHIGAN UNIV ANN ARBOR DEPT OF PSYCHOLOGY
HIPPOCAMPAL ABLATION AND BEHAVIOR.
Final rept.,
by Robert L. Isaacson. Aug 65, 74p. Rept. no. 06091-1-F
Contract DA MD49 193 64G120 Proj. ORA06091

Unclassified report

Descriptors: (*Behavior, Cerebral cortex), (*Cerebral cortex, Behavior), (*Brain, Damage), Learning, Retention, Conditioned reflex, Training, Thalamus, Excision, Surgical techniques, Histology, Neurology, Psychology, Rats

The behavioral effects of radical bilateral hippocampectomies and partial neodecortization are described in a number of behavioral situations. Both 'postoperative retention' and 'postoperative acquisition' paradigms were used in different studies. The studies show that the ability of a hippocampectomized rat to withhold responses is not completely absent, but depends, in part, upon the nature of previous training. Furthermore, we have found that preoperative acquisition of a response requiring a withholding of a response does not prevent the postoperative loss of the ability to perform the response following hippocampal destruction. Other studies of postoperative retention of simple behavioral responses following damage to the limbic system, diencephalon, and basal ganglia are included. (Author)

AD-621 973 Div. 28/3 ,16/12,16/1
CFSTI Prices: HC $2.00 MF $0.50
HARVARD UNIV BOSTON MASS MEDICAL SCHOOL
STUDIES ON THE REINFORCEMENT OF SPONTANEOUS ELECTRODERMAL ACTIVITY.
Technical rept.,
by Andrew Crider, David Shapiro, and Bernard Tursky. May 65, 30p. Rept. no. TR-13
Contract Nonr186643 Grant ,NIMH M5T1MH7084 05 Proj. NR170 518 ,NR142000

Unclassified report

Descriptors: (*Autonomic nervous system, Galvanic skin response), (*Galvanic skin response, Psychophysiology), Skin, Hands, Stimulation, Emotions, Pulse rate, Respiration, Nervous system, Physiology, Electrocardiography, Analysis of variance, Humans, Graphics

A series of studies designed to evaluate the effect of reinforcing the occurrence of spontaneous skin potential responses recorded from the palmar surface of the hands in human subjects is presented. Contingent reinforcement results in a heightened rate of response emission when evaluated against a non-contingent reinforcement control in a variety of experimental designs. An activating, as opposed to a neutral, instructional set increases the inter-subject reliability of the phenomenon by promoting the occurrence of resting level spontaneous activity. The effect is independent of time trends in skin potential level, heart rate, respiration rate, and gross skeletal activity. Theoretical and research implications of operant autonomic conditioning are discussed. (Author)

AD-621 974 Div. 28/5
CFSTI Prices: HC $5.00 MF $1.00
COLORADO UNIV BOULDER
CONCEPTUAL SYSTEMS AND BEHAVIOR STYLES.
Doctoral thesis,
by Samuel F. Kritzberg. Aug 65, 188p. Rept. no. TR-13
Contract Nonr114707

Unclassified report

Descriptors: (*Personality, Perception (Psychology)), (*Group dynamics, Attitudes), Behavior, Leadership, Psychometrics, Decision making

Twenty-four subjects were observed under conditions in which basic concepts were either supported (confirmation) or contradicted (refutation) by a person of perceived higher status (a confederate of E). It was found that: (1) Authority-oriented persons demonstrated evasive directiveness, socially-permissible dependence, passive resistance, and strong acceptance of assigned higher status; (2) Individuals with anti-authority and negativistic dispositions were competitive, aggressively challenging, and critical, and also were less inclined than others to give unequivocal agreement; (3) Peer and friendship-centered subjects evidenced a suppression of personal confidences; and (4) Per-

sons oriented toward information-seeking and exploratory behavior gave relatively many interpretive and clarifying responses.

AD-621 988 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
STATE UNIV OF NEW YORK BINGHAMTON
THE SUCCESSION PROCESS IN GROUPS AND ORGANIZATIONS.
Final rept.,
by Donald B. Trow. Aug 65, 4p. Contract Nonr367900 Proj. NR170 331
Unclassified report

Descriptors: (*Social psychology, Group dynamics), Leadership, Performance (Human), Analysis

A summary is given of work accomplished in the following areas: invention, design, and construction of a laboratory procedure for group structure analysis; status relations and replacement of group members; research facilities and training.

AD-621 989 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
MIAMI UNIV CORAL GABLES FLA DEPT OF PSYCHOLOGY
MOTIVATIONAL AND INCENTIVE FACTORS IN SOCIALLY INFLUENCED BEHAVIOR.
Annual rept. no. 4,
by John W. McDavid. 1 Oct 65, 6p. Contract Nonr400808 Proj. NR177 303
Unclassified report

Descriptors: (*Group dynamics, Behavior), (*Behavior, Social psychology), (*Motivation, Group dynamics), Learning, Personality, Correlation techniques

AD-622 002 Div. 28/1 ,32/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SEMANTICS OF UNCERTAINTY: SOME PSYCHOPHYSICAL CORRELATES.
Professional paper,
by R. V. Katter, and E. H. Holmes. 9 Aug 65, 23p. Rept. no. SP-1937
Unclassified report

Prepared for presentation at the Western Psychological Association meeting at Honolulu, 14-19 Jun 65.

Descriptors: (*Decision making, Errors), (*Psychometrics, Decision making), Language, Reasoning, Probability, Attitudes, Social communication, Behavior, Statistical analysis

The making of decisions under conditions of uncertainty is a ubiquitous aspect of the individual's information processing behavior. Consequently, a considerable portion of his communicative activity is occupied with attempts to express the nature of his decision processes. Since the accuracy of such communication is of some social importance, the present study sought to discover the kinds of errors that may occur in communications about uncertain decisions. Experimental subjects were shown statements expressing different degrees of 'chance' for the occurrence of a certain event, and also statements expressing different degrees of 'confidence' in predicting the occurrence or nonoccurrence of that event. In response to each statement subjects adjusted a device that indicated graphically the probability of occurrence of the event that they thought the statement expressed. Results suggest that statements directly expressing the subjective probability of occurrence of an event are seldom misunderstood. Also, it appears that statements expressing high confidence in predicting the occurrence or nonoccurrence of an event are rarely misunderstood. However, statements expressing low confidence in predicting either occurrence or nonoccurrence of an event are frequently misunderstood in any one of three ways. Some of the possible implications of these findings for social communication and for decision making are discussed. (Author)

AD-622 007 Div. 28/3 ,6/6 ,19/3
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE DETECTION OF COMPOUND MOTION.
Professional paper,
by A. S. Cooperband, and L. T. Alexander. 30 Jul 65, 15p. Rept. no. SP-1946/001/00
Unclassified report

Descriptors: (*Space perception, Target discrimination), (*Target discrimination, Space perception), (*Rendezvous guidance, Space perception), (*Aviation safety, Space perception), Trajectories, Flight paths, Geometry, Motion, Detection, Mathematical prediction, Plan position indicators

An analysis of the geometry of the two-target collision prediction situation, and of related research, when taken together suggested that omega, the rate of change of the relative bearing between the two targets, could be a sufficient cue for collision prediction. An abstraction of the geometric situation was used to study the ability of an observer to detect a rotational motion superimposed on a translational motion. The results indicated that omega was used as the cue for detecting this rotational component of motion. (Author)

AD-622 015 Div. 28/1 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE COMPUTER IN PSYCHOLOGICAL EXPERIMENTATION.
Professional paper,
by Alvin S. Cooperband. 29 Jul 65, 11p. Rept. no. SP-1516/000/00
Unclassified report

Presented by the author at the Annual Meeting of the Western Psychological Association (44th), Portland, Oregon, 1964.

Descriptors: (*Digital computers, Psychology), (*Psychology, Digital computers), Data processing systems, Computer logic, Special purpose computers, Programming (Computers), Costs, Statistical analysis

Great economies in experimenter time can result from using a computer to design and conduct an experiment as well as to analyze the results. A psychological study is described where the experiment was constructed, controlled, and analyzed entirely by a computer. The general characteristics and expense of such a computer program system are discussed. (Author)

AD-622 103 Div. 28/3
STANFORD RESEARCH INST MENLO PARK CALIF
ONSET VS. RECOVERY IN THE AVERSIVE EFFECTS OF ELECTROCONVULSIVE SHOCK,
by R. Gerry Dawson, and Gordon T. Pryor. 1965, 2p. Contract Nonr299300
Unclassified report

Pub. in Psychon. Sci. v3 p273-4 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Shock therapy, Reaction (Psychology)), Convulsive disorders, Mental disorders, Psychophysiology, Stimulation, Fear, Analysis of variance, Rats

When the place of administration and of recovery from a series of electroconvulsive shock (ECS) treatments was systematically varied in a two-compartment box, groups of shocked rats spent significantly less time in the compartment where ECS was administered than did controls. Place of recovery appeared to be unimportant and no indications of amnesia resulting from the ECS were observed. (Author)

AD-622 127 Div. 28/1
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C
THE DEVELOPMENT OF CONSERVATION OF SIZE,
by Martin D. S. Braine, and Betty L. Shanks. May 64, 16p.
Unclassified report

Pub. in the Journal of Verbal Learning and Verbal Behavior v4 n3 p227-42 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Perception (Psychology), Illusions), (*Illusions, Perception (Psychology)), Children, Visual acuity, Verbal behavior, Learning, Training, Performance (Human), Colors

It was pointed out that the questions used in many Piagetian experiments on the conservations and concrete operations are ambiguous, e.g., 'Which is bigger.' means either 'Which looks bigger.' or 'Which is really bigger.' The development of conservation of size was investigated in a series of experiments in which illusory size changes were created in a variety of ways. On successive trials a stimulus item was made first to look bigger and then to look smaller than another stimulus item. Three experiments required correct differential responses to the questions 'Which looks bigger.' and 'Which is really bigger.' and one experiment required that the question 'Which is bigger.' be interpreted as a question about real size. The experiments showed (1) that by about five years of age a majority of children are capable of a distinction between real and phenomenal size which is not at all task specific, and (2) that children under seven tend to construe questions containing the word 'bigger' as questions about phenomenal size, unless feedback information forces a 'reality' interpretation. The data suggest that early stages of development are not amenable to study by traditional Piagetian procedures, which do not elicit the processes under investigation in the younger Ss. It was proposed that what has to be explained in accounting for the conservations is the emergence of a general distinction between real and phenomenal properties of objects. (Author)

AD-622 139 Div. 16/12,16/3
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DIV OF NEUROPSYCHIATRY
CORTICOSTEROID RESPONSES TO HOSPITAL ADMISSION,
by John W. Mason, Edward J. Sachar, Jacob R. Fishman, David A. Hamburg, and Joseph H. Handlon. 18 Jan 65, 8p.
Unclassified report

Pub. in the Archives of General Psychiatry, v13 p1-8 Jul 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Corticosteroid agents, Reaction (Psychology)), Hospitals, Emotions, Urine, Excretion, Pshchophysiology, Stress (Psychology), Statistical analysis

Urinary 17-OHCS levels were measured in 60 normal adults during their admission to a hospital control research ward. 17-OHCS levels were significantly higher on the day of admission than later in hospitalization. Evidence is offered that these 17-OHCS changes were part of the subjects' psychoendocrine response to environmental change. A considerable range of group and individual differences was observed, and the feasibility of using hospital admission as a predictable means of eliciting emotional arousal in psychosomatic research is discussed. The data indicate a need for environmental factors to be taken carefully into account

in the design of control experiments in clinical research. Some possible implications of relatively stable differences in urinary 17-OHCS excretion patterns are discussed. (Author)

AD-622 155 Div. 28/1 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
ADAPTATION TO DELAYED SIDE-TONE I.
Research rept.,
by Chester J. Atkinson. 23 May 52, 12p. Rept. no. joint project rept. no. 12
Contract N6onr22525 Proj. NR142 992 ,NM001 064 01 12
NAVMED , NM-001-064.01.12
Unclassified report

Descriptors: (*Psychoacoustics, Speech), (*Speech, Adaptation (Physiology)), Behavior, Proprioception, Hearing, Analysis of variance

The side-tone of speakers was delayed while 60 phrases were read. These 60 phrases were read slower and louder than phrases read without delayed side-tone. There was no trend demonstrated during the course of reading the 60 phrases to indicate that speakers adapted to delayed side-tone. There was some increase in the loudness with which the first few phrases were read. (Author)

AD-622 156 Div. 28/1 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
KENYON COLL GAMBIER OHIO
RATE OF SPEAKING (RESPONSES TO HEARD STIMULI). III. RELATIONSHIP BETWEEN ORIGINAL AND REPEATED PHRASES FOR SPEAKERS WITH VARIOUS NORMAL RATES.
Rept. no. 2,
by Charles Lightfoot. 23 Sep 49, 11p. Rept. no. joint project rept. no. 3.2
Contract N7onr41101 Proj. NR782 004 ,NM001 053
NAVMED , NM-001-053
Unclassified report

Descriptors: (*Psychoacoustics, Speech), Hearing, Reading, Velocity, Analysis of variance

An evaluation of the effect of normal speech rate on the relationship between the rate of repeated phrases and the rate of the original phrases was undertaken. Twenty-five subjects were divided into five equal groups on the basis of time taken to read a list of meaningful phrases and sentences. Five lists of phrases, comparable in all respects save rate, were presented to each subject, who was instructed to repeat each phrase in a natural manner. Analysis of the durations of the repeated phrases indicated that original phrase rate influenced the response rates of subjects in the three faster speaking groups in a more uniform way than it influenced the less fluent subjects; there was a definite relationship between rates of original and repeated phrases for the fast-speaking groups and for the slow-speaking groups. (Author)

AD-622 162 Div. 28/3 ,5/5
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
LISTENER PERFORMANCE AS A FUNCTION OF LISTENING TIME FOR VARIOUS SIGNAL-TO-NOISE CONDITIONS,
by Robert W. Peters. 1 Jun 55, 10p. Rept. no. joint proj-53
Contract N6onr22525 Proj. NR145 993 ,NM001 104 500.53
NSAM , 631
Unclassified report

Descriptors: (*Psychoacoustics, Speech), (*Speech, Intelligibility), (*Hearing, Signal-to-noise ratio), Voice communication systems, Speech recognition, Human engineering, Time, Analysis of variance

Listener reception was evaluated, with respect to values earned at the end of eight cumulative time intervals during an hour of continuous testing, for several signal-to-noise conditions. The noise was babel, prepared by superimposing two voices on a single recording. Mean values of listener reception did not follow the same trend for each listening condition. As the signal-to-noise ratio was decreased, a temporary decrement in listener reception followed after approximately one-half hour of listening. This decrement became more pronounced and more lasting as the signal-to-noise ratio was decreased. (Author)

AD-622 178 Div. 28/3 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
A REPORT ON SAMPLE BINOCULAR SERIAL NO. 6268 MARK I, MODEL 2,
by C. W. Shilling. 23 Jul 43, 22p. Rept. no. MRL-24
Unclassified report

Descriptors: (*Binoculars, Human engineering), Performance tests, Vision, Focusing

No significant differences were found between the performance of men using the sample rigid binoculars and the standard adjustable 7 x 50 binoculars under similar conditions. This conclusion is true not only of men whose focus and IPD approximated those built into the rigid binoculars, but also of those whose focal adjustments were divergent from those of the binoculars. There is evident a poorer performance on the part of men with IPD's markedly divergent from that for which the rigid binocular is set. The sample Interpupillary Distance Setting Gauge has been found to be a simple and effective method of maintaining IPD setting in proper adjustment. Its use is recommended. The focus and IPD adjustments which the average enlisted man makes for his eyes are highly variable and are not to be relied upon. (Author)

AD-622 188 Div. 28/4 ,23/1
CFSTI Prices: HC $1.00 MF $0.50
ADJUTANT GENERAL DEPT OF THE ARMY WASHINGTON D C
VALIDATION OF THE WEST POINT SELFDESCRIPTION BLANK,
by H. E. Brogden, and Manus R. Munger. 17 Nov 50, 11p. Rept. no. PRS-872
Unclassified report

Descriptors: (*Psychometrics, Army personnel), (*Army personnel, Selection), Aptitude tests, Personality, Perception (Psychology), Performance (Human), Factor analysis, Statistical analysis

The paper is one of a series of studies on the development of a self-description blank for possible use with other selection measures in identifying candidates for West Point who are likely to be rated low on aptitude for military service. The primary purpose of this study was the development and evaluation of scoring keys for this blank. Some findings on methods of selecting items and on types of item content are discussed.

AD-622 189 Div. 28/4 ,23/1
CFSTI Prices: HC $1.00 MF $0.50
ADJUTANT GENERAL DEPT OF THE ARMY WASHINGTON D C
CONSTRUCTION OF A SELF-DESCRIPTION BLANK FOR ARCTIC ASSIGNMENT,
by S. H. King. 21 Nov 49, 7p. Rept. no. PRS-835
Unclassified report

Descriptors: (*Army personnel, Selection), (*Psychometrics, Army personnel), (*Test construction (Psychology), Personality), Arctic regions, Factor analysis, Perception (Psychology)

A biographical self-description blank was among the experimental selection tools planned for possible use in assigning men to duty in the Arctic. In a previous study, a large number of descriptive phrases relating to ability to adjust to conditions of Arctic assignment had been developed. These phrases were to be paired and the men instructed to check in each pair the phrase most nearly describing themselves. Conclusions: As a result of this pairing, it is expected that the ability of men to 'beat' the test will be minimized and the significance of their choices between the phrases maximized. Although the validities of the phrases before they were paired has been measured, further study is necessary to determine the validities of the items in paired form.

AD-622 208 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
MIAMI UNIV CORAL GABLES FLA DEPT OF PSYCHOLOGY
THE SEX VARIABLE IN CONFORMING BEHAVIOR.
Technical rept.,
by John W. McDavid. Aug 65, 19p. Rept. no. TR-8
Contract Nonr400808 Proj. NR177 303
Unclassified report

Descriptors: (*Behavior, Social psychology), (*Social psychology, Sex), Males, Females, Motivation, Personality, Psychometrics, Statistical analysis, Analysis of variance

The study calls into question the fact that, in most experimental studies, the tendency for females to be more susceptible to pressures toward conformity to group influences has been attributed to cultural prescriptions for the female sex role. A battery of items was developed to isolate (a) item ambiguity or difficulty of judgment, and (b) characterization of the item content as an area of masculine, feminine, or neutral interest and sophistication. Under these conditions, it was found that overall females yielded no more often than males to the pressures of an anonymous majority. More importantly, females yielded more often than males only on judgments which had been consensually characterized as areas of masculine interest and sophistication. The data thus suggest that the 'sexrole' interpretation of sex differences in conforming behavior may be an over-simplification which ignores the operation of more specific variables such as subjective confidence in the area of influenced judgment. (Author)

AD-622 231 Div. 28/5 ,23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A STUDY OF THE INTERPERSONAL VALUES REPORTED BY NAVAL AVIATION PREFLIGHT STUDENTS.
Research rept.,
by Lawrence K. Waters. 9 Jul 65, 14p. Rept. no. NSAM-938
NAVMED , MF022.01.02-5001.1-45
Unclassified report

Descriptors: (*Aviation personnel, Group dynamics), (*Naval personnel, Group dynamics), (*Group dynamics, Students), Training, Flight, Personality, Correlation techniques, Leadership, Psychometrics

Changes in reported interpersonal values during pre-flight training and the relationship among surveyed, self-rated, and peer-rated values were determined. Significant changes in mean scale scores occurred after fourteen weeks of training and correlations between corresponding value scales ranged from .53 to .68. Difference in magnitude of the correlations among surveyed, self-, and peer-rated interpersonal values were found and related to variations in rater and reference frame. (Author)

AD-622 248 Div. 28/1 ,28/4
CFSTI Prices: HC $3.00 MF $0.75
STANFORD UNIV CALIF INST FOR MATHEMATICAL STUDIES IN THE SOCIAL SCIENCES
REINFORCEMENT-TEST SEQUENCES IN PAIRED-ASSOCIATE LEARNING.
Technical rept.,
by Chizuko Izawa, and W. K. Estes. 1 Aug 65, 85p. Rept. no. TR-76
Contract Nonr22573 Grant ,PHS MH0654 04
Proj. NR154 218
Unclassified report

Descriptors: (*Learning, Word association), (*Word association, Learning), (*Psychometrics, Mathematical models), Retention, Training, Conditioned reflex, Numbers, Performance tests, Errors, Probability, Tables, Graphics

Learning of paired-associate items was studied in relation to different repetitive sequences of reinforced (R) trials and test (T) trials. One purpose was to obtain evidence as to whether either learning or forgetting occurs on unreinforced T trials; a second was to adduce principles bearing on the problem of optimal programming of R and T trials. The four training conditions were: (1) R T R T ...; (2) R R T R R T ...; (3) R T T R T T ...; (4) R R T T R R T T ... . Five items were assigned to each condition and the sequences were repeated till a criterion of learning was reached. Two groups of 50 subjects were run; one with nonsense syllable-number pairs and one with nonsense syllable-word pairs. Performance on tests given successively without intervening reinforcement showed no significant change in correct response probability--suggesting that neither learning nor forgetting occurred on T trials per se. The course of learning was, however, affected to a major extent by the ratio of Ts to Rs and by their arrangement in the various repetitive sequences. Learning curves plotted in terms of error proportion on the first T following the n (th) R trial lined up in the order: Condition 3 (lowest), 1, 4, 2. (Author)

AD-622 252 Div. 28/4 ,32/9 ,28/5
CFSTI Prices: HC $1.00 MF $0.50
DUKE UNIV DURHAM N C
INFORMATION OR NOISE. AN INVESTIGATION OF RESPONSE ERRORS.
Technical rept.,
by Engin Inel Holmstrom. Sep 65, 24p. Rept. no. TR-18
Contract Nonr118111 Proj. NR177 470
Unclassified report

Descriptors: (*Behavior, Social psychology), (*Social sciences, Scientific research), Performance (Human), Reaction (Psychology), Test construction (Psychology), Attitudes, Motivation, Psychometrics, Public opinion

Response Errors are categorized into two major groups: (1) Respondent Errors, i.e., Deliberate and Reporting Errors and (2) Instrument Errors, i.e., Commitment, Item-order, and Item-tone Errors. A review of literature is undertaken, investigating different sources of Responsé Errors. It is shown that respondent behavior is generally a function of three major stimuli: item-content, social, and instrument. (Author)

AD-622 253 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
WASHINGTON UNIV ST LOUIS MO DEPT OF PSYCHIATRY
VARIABLES UNDERLYING GROUP EXPECTANCIES AND LEADERSHIP.
Annual rept. for 1965,
by Richard H. Willis. 1 Oct 65, 11p. Contract Nonr81612 Proj. NR171 488
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Leadership, Social psychology), (*Group dynamics, Leadership), Personality, Perception (Psychology), Reaction (Psychology), Attitudes, Culture

The project has been directed mainly toward a study of factors producing leadership status and social influence in small groups. A number of lines of investigation have been followed growing out of the 'idiosyncrasy credit' model of status, developed earlier by Dr. E. P. Hollander, as well as from interest in various patterns of response which bear upon social processes related to leadership. The work has involved both conceptual and experimental approaches to an understanding of the mechanisms interrelating leadership emergence, productivity and satisfaction in groups, conformity to group expectations, and alternatives to conformity.

AD-622 285 Div. 28/4 ,28/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A STUDY OF STATEMENT ATTRACTIVENESS INDICES OBTAINED UNDER PERSONAL AND SOCIAL ORIENTATIONS.
Research rept.,
by Lawrence K. Waters. 8 Jul 65, 10p. Rept. no. NSAM-937
NAVMED , MF022.01.02 5001.44
Unclassified report

Descriptors: (*Aviation personnel, Psychometrics), (*Psychometrics, Analysis), Social psychology, Decision making, Training, Correlation techniques

Two indices for matching items on forced-choice scales for use with cadet groups were evaluated. Index deviation values for two indices of statement attractiveness, stressing either the personal or social acceptability of the statements, were correlated with each other, with four other attractiveness indices obtained previously, and with frequencies of statement choice obtained under four response sets. The correlation between the two indices and their relationship to previously obtained attractiveness indices and choice frequencies indicated the personal and socially oriented indices represented essentially the same attractiveness dimension for the cadet groups. The dimension appeared to be one of general desirability as contrasted to specific job (training program) desirability. (Author)

AD-622 298 Div. 28/3 ,16/1 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
PRELIMINARY STUDY OF DIAL READING PERFORMANCE DURING SUSTAINED ACCELERATION AND VIBRATION.
Final rept. for Mar-Aug 63,
by Neville P. Clarke, Harvey Taub, Harris F. Scherer, William E. Temple, and Hubert E. Vykukal. Aug 65, 19p. Contract AF33 657 11729
Proj. 7231 Task 723101
AMRL , TR-65-110
Unclassified report

Research conducted jointly with NASA.

Descriptors: (*Space crews, Performance (Human)), (*Reading, Acceleration tolerance), (*Human engineering, Vibration), (*Space environmental conditions, Human engineering), Display systems,Stress (Physiology), Acceleration, Errors, Gravity

Booster induced spacecraft vibrations occur in combination with booster induced sustained acceleration. This was a joint NASA-AF study to provide a preliminary cursory evaluation of the effects of this environment on crewmen. Six subjects were used in 60 tests to measure the decrement in dial reading ability as a function of the level of 11 cps gx vibration and the size of the dial, where a bias acceleration of 3.85 Gx was superimposed on the vibration. Dial reading errors were inversely related to the arc length of the interval between dials and directly related to the amplitude of vibration. There was approximately 50% distortion of the 11 cps vibration acceleration, which markedly influences the interpretation of results and their comparison to measurements of visual decrements from 11 cps vibrations with 1Gx bias loads. In most general terms, however, the 3.85Gx bias, and/or the unidirectional force (i.e., the resultant acceleration was always greater than 0 G) creates a subjectively more tolerable environment than with a 1 G bias. Vibrations of 3.85Gx !3.Ogx were without serious subjective effects in exposures of 90 seconds duration. Gross comparisons of dial reading performance under the two conditions provide some indication that the greater bias acceleration is associated with less visual decrement. (Author)

AD-621 664 See Fld. 6/16
AD-621 698 See Fld. 5/9
AD-621 700 See Fld. 5/9
AD-621 701 See Fld. 5/9
AD-621 834 See Fld. 6/16
AD-621 905 See Fld. 6/16
AD-621 923 See Fld. 5/9
AD-621 952 See Fld. 5/9
AD-621 954 See Fld. 5/9
AD-621 961 See Fld. 5/9
AD-621 999 See Fld. 5/9
AD-622 039 See Fld. 5/9
AD-622 050 See Fld. 5/9
AD-622 085 See Fld. 17/9
AD-622 122 See Fld. 6/15
AD-622 166 See Fld. 6/16
AD-622 167 See Fld. 5/9
AD-622 176 See Fld. 5/9
AD-622 179 See Fld. 5/9
AD-622 186 See Fld. 5/9
AD-622 214 See Fld. 5/9
AD-622 215 See Fld. 5/9
AD-622 219 See Fld. 5/9

AD-622 273 See Fld. 6/16

AD-622 293 See Fld. 5/9

AD-622 295 See Fld. 5/9

AD-622 296 See Fld. 5/9

AD-622 297 See Fld. 5/9

5/11. SOCIOLOGY

AD-622 014 Div. 32/9
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
INTERVENTION DESIGN IN COMMUNITY DEVELOPMENT: PRELIMINARY RESULTS OF A LOCAL ACTION PROGRAM IN LOS ANGELES.
Professional paper,
by Alfred P. Parsell. 20 Aug 65, 21p. Rept. no. SP-2076

Unclassified report

Prepared for presentation at the Meeting of the Society for the Study of Social Problems, 29 Aug 65, Chicago, Ill.

Descriptors: (*Sociology, California), (*Delinquency, Control), Management planning, Adolescents, Urban planning

Social action programs involving community development must take into account two basic considerations: (1) the problem of definition, since every social action program has community development components in that they represent intervention in some kind of community; and (2) the related problem of approach, since in the action program a decision must be made as to whether community development is to be viewed as a separate and distinct program in itself, or whether it is to be viewed as a planned or serendipitous attribute of all community intervention programs and, thus, a procedural rather than content element in social action. A partial test to explore the feasibility of employing community development as a content (program) area was included in the design of the broad-based community intervention program of the Youth Opportunities Board of Greater Los Angeles. For a number of reasons, many beyond the control of the YOB staff, a full test of the approach was not completed and significant evaluation was not possible. Analysis of the data available, incomplete and sketch though they may be, suggests that the decision ultimately made by program management on the basis of purely practical considerations may have been the correct one.

AD-622 002 See Fld. 5/10

AD-622 017 See Fld. 9/2

AD-622 238 See Fld. 15/7

AD-622 252 See Fld. 5/10

6/1. BIOCHEMISTRY

AD-621 631 Div. 16/3
ARMY RESEARCH INST OF ENVIRONMENTAL MEDICINE NATICK MASS BIOCHEMISTRY LAB
WHAT IS 'TRUE' BLOOD GLUCOSE; A COMPARISON OF THREE PROCEDURES,
by Milton Mager, and Genevieve Farese. 20 Nov 64, 6p.

Unclassified report

Pub. in American Journal of Clinical Pathology v44 n1 p104-8 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Blood chemistry, Glucose), (*Glucose, Blood chemistry), Blood analysis, Blood, Blood plasma, Enzymes, Oxidoreductases, Pathology

Procedures for estimating glucose in plasma and whole blood were compared. For plasma, the estimation of glucose by the chemical Somogyi-Nelson procedure and by the enzymatic glucose oxidase, or coupled hexokinase reaction is not affected by the method of preparation of the protein-free filtrate, and intraprocedural differences are small. However, consistently lower values are obtained by the enzymatic assays, and probably represent a more valid index of 'true' plasma glucose than the chemical procedure. For whole blood estimations, all procedures are affected by the method of filtrate preparation, and variable intraprocedure differences are obtained. Considering the inconsistencies which are caused by difference in the protein precipitation, and by the differences in the quantity of cellular components in blood, it is suggested that analysis of whole blood be abandoned, and that plasma assays based on enzymatic systems constitute the procedure of choice for estimating 'true' glucose in the circulation. (Author)

AD-621 665 Div. 16/3,4/3
FLORIDA STATE UNIV TALLAHASSEE INST OF MOLECULAR BIOPHYSICS
SYNTHESIS OF PEPTIDE POLYMERS WITH REPEATING SEQUENCES,
by D. F. DeTar, W. Honsberg, U. Honsberg, A. Wieland, and M. Gouge. 19 Jun 63, 5p. Contract AF AFOSR62 279 Proj. 9762 Task 976202 AFOSR , 65-1250

Unclassified report

Pub. in Journal of the American Chemical Society v85 n2873-4 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Proteins, Synthesis (Chemistry)), (*Peptides, Synthesis (Chemistry)), Amino acids, Molecular structure, Polymerization, Nuclear magnetic resonance

A general route was developed to an important class of peptide polymers having known repeating sequences in chains of random length. The active ester method was found to be the most suitable for preparing (L-Asp- (OCH3)Gly-Gly)n with average degrees of polymerization estimated to be 25 or more. The polymerization is monitored by the nmr spectra in trifluoroacetic acid solutions. Comparable results were obtained with (Asp-(OCH3)-Phe-Gly)n and (His-Gly-Gly)n from the corresponding tripeptide derivatives and (Phe-Gly)n from HBr.H.-Phe-Gly-ONP. (Author)

AD-621 670 Div. 16/3,4/3
WASHINGTON UNIV ST LOUIS MO SCHOOL OF MEDICINE
FLUOROMETRIC MICRODETERMINATION OF HEME PROTEIN,
by George R. Morrison. 8 Jun 65, 4p. Contract DA49 007MD1024 Grant ,PHS AM06309 02

Unclassified report

Pub. in Analytical Chemistry v37 n9 p1124-6 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Microanalysis, Proteins), (*Proteins, Chemical analysis), (*Hemoglobin, Chemical analysis), Fluorescence, Chemical indicators, Porphyrins, Oxalates, Quantitative analysis, Histological techniques

A fluorometric method is described for the measurement of as little as 0.01 microgram of heme protein in animal tissues. The method is based upon conversion of the protein's heme moiety to its fluorescent porphyrin derivative by incubation with oxalic acid. The relative standard deviation with the proposed procedure is about 2%. The simplicity of the procedure and the stability of the fluorescence facilitate the measurement of a large number of samples. The determination of heme proteins in biopsy material from several organs has been shown to be primarily dependent on the hemoglobin concentration. (Author)

AD-621 672 Div. 16/3
WASHINGTON UNIV ST LOUIS MO SCHOOL OF MEDICINE
FLUOROMETRIC MEASUREMENT OF PHOSPHOGLUCOISOMERASE,
by George R. Morrison. 20 Jan 65, 9p. Contract DA49 007MD1024 Grant ,PHS AM06309 02

Unclassified report

Pub. in Analytical Biochemistry v12 n1 p150-6 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Isomerases, Chemical analysis), Liver, Enzymes, Chemical indicators, Fluorescence, Colorimetric analysis

A fluorometric method is described for assaying phosphoglucoisomerase in as little as 0.05 microgram of frozen-dried sections of liver. The simplicity of the procedure and the stability of the fluorescence facilitate the measurement of a large number of samples. Several steps in the procedure were studied in detail. (Author)

AD-621 731 Div. 16/3
CALIFORNIA UNIV LOS ANGELES SCHOOL OF MEDICINE
STIMULATION OF STEROID TRANSFORMATIONS IN ADRENAL MITOCHONDRIA BY CYCLIC 3', 5'ADENOSINE PHOSPHATE,
by Sidney Roberts, John E. Creange, and Peggy L.Young. 2 Jul 65, 6p. Contract NSF GB2500 Proj. NR101 402

Unclassified report

Pub. in Biochemical and Biophysical Research Communications v20 n4 p446-51 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Steroids, Transformations), (*Mitochondria, Steroids), (*Adenosine phosphates, Steroids), (*Corticosteroid agents, Transformations), Cholesterol, Adrenal glands, Catalysis, Chromographic analysis, Stimulation

It is demonstrated that 3', 5'-AMP enhances additional steroid conversions in mitochondria, including the transformation of 11-deoxycorticosterone to 18-hydroxy11-deoxycorticosterone and the production of pregnenolone from exogenous cholesterol.

AD-621 787 Div. 16/3
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
LABELLING OF HUMAN FIBRINOGEN WITH IODINE131 BY ELECTROLYTIC IODINATION,
by U. Rosa, G. A. Scassellati, F. Pennisi, N. Riccioni, and P. Giagnoni. 26 Sep 63, 9p. Rept. no. SORIN-48

Unclassified report

Pub. in Biochim. Biophys. Acta v86 p519-26 1964 (Copies available only to DDC users). Prepared in cooperation with Pisa Univ. (Italy). Center of Nuclear Medicine.

Descriptors: (*Proteins, Halogenation), (*Fibrinogin, Halogenation), (*Iodine compounds, Fibrinogen), (*Labelled substances, Fibrinogen), Radioactive isotopes, Electrochemistry, Potassium compounds, Iodides, Electrolysis, Electrophoresis, Tracer studies, Italy

An original method for labelling proteins with radioactive I is proposed, and its application to the 1311 iodination of human fibrinogen is illustrated. The method is based on the electrolysis of a solution of K1311 in presence of the protein to be labelled. The labelling procedure and the electrolytic cell are described in detail. The advantages in comparison with the traditional techniques are 3-fold: (a) there is no need of oxidizing agents; (b) the possibility exists of controlling the rate of liberation of I; and (c) there is the possibility of using extremely dilute solutions of KI, thus reducing the amount of I introduced into the molecule for a given specific activity. The product thus obtained does not show modifications of its original characteristics, as judged from electrophoresis in agar and from the values of the 'turnover-time' which are obtained in a group of normal human subjects. (Author)

AD-621 792 Div. 16/3
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
PROTEIN LABELLING WITH RADIOIODINE BY ELECTROCHEMICAL WAY. NOTE I: IODINATION OF TYROSINE,
by C. Ambrosino, J. Liberatori, U. Rosa, G. A.-Scassellati, and F. Pennisi. 15 Apr 64, 13p. Rept. no. SORIN-54

Unclassified report

Pub. in La Ricerca Scientifica a34 s2 ptIIB v4 n5 p669-80 Roma 1964 (Copies available only to DDC users).

Descriptors: (*Tyrosine, Halogenation), (*Labelled substances, Tyrosine), (*Proteins, Halogenation), (*Iodine compounds, Tyrosine), Radioactive isotopes, Electrochemistry, Blood proteins, Tracer studies, Potassium compounds, Iodides, Italy

An electrolytic technique is described which permits the iodination of tyrosine in highly diluted KI solutions and almost in the conditions naturally occurring in the human plasma. The method seems promising for labelling some serium proteins with controlled amounts of I131.

AD-621 794 Div. 16/3
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
PROTEINS RADIOIODINATION BY AN ELECTROLYTIC TECHNIQUE,
by U. Rosa, G. Scassellati, F. Pennisi, C. Ambrosino, and J. Liberatori. 1965, 17p. Rept. no. SORIN-57

Unclassified report

Pub. in Radioaktive Isotope in Klinik und Forschung, band VI, Funftes Internationales Symposium in Bad Gastein, Osterreich v8 n11 p258-72 1964 (Copies available only to DDC users). Prepared in cooperation with Torino Univ. (Italy).

Descriptors: (*Proteins, Halogenation), (*Serum albumin, Halogenation), (*Iodine compounds, Proteins), (*Labelled substances, Proteins), Electrochemistry, Radioactive isotopes, Potassium compounds, Iodides, Electrolysis, Amino acids, Electrophoresis, Immunology, Gamma globulin, Fibrinogen, Insulin, Tracer studies, Italy

An electrolytical method is proposed as a general tool for radioiodine labelling of proteins: elemental iodine is set free at the anode by electrolysis of a KI solution in which a protein is dissolved. Preliminary experiments carried out on the amino acids chiefly involved in protein iodination proved that for a proper value of current i.e. a proper value of elemental iodine in the solution, unwanted oxidative reactions can be minimized. A detailed investigation was carried out on the factors affecting the electrolytic process of human serum-albumin iodination. Electrophoresis and microimmuno electrophoresis on agar were adopted to check possible denaturation occurring in the proteins during the iodination process. The results obtained prove that a human serum albumin labelled with I131 at a sufficient specific activity may be produced with a 90% iodination yield and radioiodine content less than 1 atom protein molecule. Results about gamma globulin, fibrinogen and insulin iodination are also reported. I131 labelled albumin and gamma globulin were used for turnover studies in normal man, using a whole body counting system. The results obtained are briefly reviewed, and critically analyzed from the point of view of the adequacy of the tracer for protein turnover experiments. (Author)

AD-621 814 Div. 16/3
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
THIN-LAYER CHROMATOGRAPHY OF SOME 131-I AND 125-I LABELLED IODOPYRIMIDINES AND RELATED NUCLEOSIDES,
by A. Massaglia, U. Rosa, and S. Sosi. 22 Jun 64, 7p. Rept. no. SORIN-59

Unclassified report

Pub. in Journal of Chromatography v17 n2 p316-21 Feb 1965 (Copies available only to DDC users).

Descriptors: (*Labelled substances, Chromatographic analysis), (*Pyrimidines, Chromatographic analysis), (*Nucleosides, Chromatographic analysis), (*Chromatographic analysis, Labelled substances), Separation, Solvents, Autoradiography, Iodine, Radioactive isotopes, Italy

The separation of some radioiodinated pyrimidines and nucleosides of biological interest was studied by thin-layer chromatography. Rf values of iodouracil, iodocytosine, iodouridine, iododeoxyuridine and iodocytidine on layers of silica gel G and cellulose G were measured for a number of solvents: n-butanol saturated with water, water, n-butanol saturated with 0.1 N H3BO3, n-butanol saturated with i N H3BO3, a saturated solution of H3BO3 in water, 0.1 N HCOOH, n-butanol saturated with 0.1 N HCOOH and n-butanol saturated with o.i N NH4OH were used. With a proper choice of elution system and support, a very good resolution of the single spots can be attained and the relative percentages of the labelled components in a sample can be evaluated with a negligible error by radioactive scanning of the chromatographic plate. (Author)

AD-621 849 Div. 16/3
CFSTI Prices: HC $2.00 MF $0.50
AMERICAN MEAT INST FOUNDATION CHICAGO ILL
STUDIES ON MEANS OF CONTROLLING OR INHIBITING BEEF TISSUE ENZYME SYSTEMS.
Final technical rept. for May 63-May 64,
by W. A. Landmann. Sep 65, 29p. Contract DA19 129AMC87N Proj. 7X84 01 002 USA NLABS , FD-23

Unclassified report

Descriptors: (*Beef, Preservation), (*Peptide hydrolases, Inhibition), (*Irradiated foods, Peptide hydrolases), Enzymes, Control, pH, Buffers (Chemistry), Injection, Meat, Hydrolysis, Epinephrine

Control or inhibition of proteolysis in meat as influenced by pH was investigated over the pH range of 4.0 to 8.0. In non-irradiated meat inhibition has been achieved only when the pH of the meat is 4.0 to 4.5 and 6.8 to 7.0. In both cases the inhibition is slight. In irradiated meat varying degrees of inhibition of proteolysis occur throughout the entire range studied. The injection of buffers into large pieces of meat was studied to evaluate the method of stitchpumping. It was concluded that enough buffer can be introduced to be effective in altering hydrolysis but that the problems of achieving a desired pH remains. Ante-mortem control of pH was investigated in rabbit muscle by injection of epinephrine before slaughter. The inhibitory effect of the treatment on proteolysis was more pronounced in non-irradiated meat, although some inhibition was noted in irradiated meat, as well.

AD-621 926 Div. 16/3
TEMPLE UNIV PHILADELPHIA PA DEPT OF MICROBIOLOGY
MEASUREMENT AND CHARACTERIZATION OF PROTEINS BY COLOR REACTIONS,
by Gerrit Toennies, and Frances Feng. 13 Oct 64, 8p. Contract Nonr380603 Grant ,PHS AM075 30

Unclassified report

Pub. in Analytical Biochemistry v11 n3 p411-17 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Proteins, Colorimetric analysis), Measurement, Quantitative analysis, Numerical analysis, Amino acids, Desoxyribonucleic acids, Ribonucleic acids, Test methods, Tables

Two of the more sensitive methods for the determination of protein, one involving reduction of Folin's heteropolyphosphate reagent, and the other, binding of a sulfonphthalein dye, have been investigated. Improved versions of the two methods have been presented, together with the results obtained on 18 protein preparations. Without the use of microanalytical techniques, approximately 1 mg of protein is needed for duplicate determinations by both methods. The results show that different proteins cover a wide range of values in each case and that there is no uniform correlation between the two parameters measured. Therefore, the ratio of the two parameters may serve as a distinctive analytical characteristic for individual proteins or protein mixtures. Significant quantitative measurements depend on prior determination of the reactivity constants of the proteins being measured. The reactivity changes produced by exposure to alkali were also found to be distinctive for different proteins and for the two methods. Different commerical preparations of the same protein species gave resembling, but not identical, results. (Author)

AD-621 928 Div. 16/3 ,16/2
TEMPLE UNIV PHILADELPHIA PA DEPT OF MICROBIOLOGY
BACTERIAL NUCLEATE AND PHOSPHORUS PARTITION,
by Gerrit Toennies, Frances Feng, Joseph J. Kolb, and Phoebe M. Luttner. 23 Nov 64, 25p. Contract Nonr380603 ,Nonr273100

Unclassified report

Pub. in Analytical Biochemistry v11 n3 p473-96 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Bacteria, Nucleic acids), (*Nucleic acids, Separation), (*Organic phosphorus compounds, Separation), Solvent extraction, Spectra (Visible + ultraviolet), Absorption spectrum, Nucleosides, Ribonucleic acids, Desoxyribonucleic acids

Methods for the measurement of nucleates and other phosphorus-containing classes in bacteria were studied. Conditions are presented for the optimal extraction of lowand high-molecular nucleates as measured by ultraviolet absorbancy. Eight phosphorus fractions can be distinguished.

They are (expressed as per cent of the total phosphorus and presented in terms of approximate ranges encountered in Streptococcus faecalis crops of different nutritional origin): inorganic or easily hydrolyzable P (10-26), lipid P (3-10), presumptive wall teichoate P (5-11), soluble nucleoside monophosphate P (4-9), other soluble P (polyphosphates, phosphorylated intermediates, teichoates, etc.) (0-40) DNA P (4-8), RNA P (17-67), and undefined nonextractable P (3-14). The study which included analysis of commercial RNA and DNA preparations, indicates that the molar absorbancy of nucleate phosphorus at 260 millimicrons differs substantially among different preparations, presumably because of differences in their nucleobase ratios. For dependable determination of total nucleates, phosphorus partition is recommended. Application of the diphenylamine reaction to the determination of DNA in bacterial products, and in growing bacterial cultures, was also studied, and procedures are suggested. (Author)

AD-621 966 Div. 16/3
INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY
RELATION OF ANTIBODY TITER TO PERSISTENCE OF ANTIGEN,
by Maxwell Richter, Sarah Zimmerman, and Felix Haurowitz. 29 Oct 64, 5p. Contract Nonr310400 ,AT11 1 209
Unclassified report

Pub. in Journal of Immunology v94 n6 p938-41 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Immunology, Antigens + antibodies), (*Antigens + antigens, Immunology), Immunity, Antigenantibody reactions, Serum albumin, Gamma globulin, Erythrocytes, Tissues (Biology), Immune serums, Biosynthesis, Nucleic acids, Injection (Medicine), Labeled substances, Radioactive isotopes, Rabbits, Bovines

The antibody titer in the serum of rabbits injected with bovine serum albumin or ovalbumin was determined over a period of 1 to 2 years. The decrease in antibody titer, several months after the last injection, parallels in general the decrease in the amount of persisting antigen. (Author)

AD-621 967 Div. 16/3
INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY
IMMUNOLOGICAL UNRESPONSIVENESS AND AUTOANTIBODY FORMATION,
by Felix Haurowitz. 1965, 7p.
Unclassified report

Pub. in Annals of the New York Academy of Sciences v124 pt1 p50-5 Jun 30 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Immunology, Antigens + antibodies), (*Antigens + antibodies, Immunology), Humans, Proteins, Serum albumin, Gamma globulin, Antigen-antibody reactions, Biosynthesis, Nucleic acids, Crystallization, Crystal lattices, Cytoplasm, Granules, Tolerances (Physiology), Rabbits, Bovines

Self-recognition and horror autotoxicus are merely special instances of the more general phenomenon of immunological unresponsiveness caused by an excess of antigen. (Author)

AD-622 135 Div. 16/3 ,4/2
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DIV OF BIOCHEMISTRY
ANODIC-STRIPPING VOLTAMMETRY OF BIOLOGICAL SAMPLES,
by Carvel L. Newberry, and Gary D. Christian. 12 Jan 65, 6p.
Unclassified report

Pub. in Journal of Electroanalytical Chemistry v9 p468-72 1965 (Copies available only to DDC users).

Descriptors: (*Biological assay, Polarographic analysis), (*Labeled substances, Determination), Electrolytes, Anodes (Electrolytic cell), Mercury, Potassium compounds, Chlorides

Anodic-stripping voltammetry can be applied directly to biological samples following dry-ashing and dissolution in purified water. Measurements have been made of pH and resistance of solution and linearity has been established between concentration of metal ion and stripping peak height. A standard addition method is recommended to obtain qualitative and quantitative results. Stripping peak potentials vs. the mercury pool anode of some common metals in several different biological sample solutions are reported. (Author)

AD-622 146 Div. 16/3
MICHIGAN UNIV ANN ARBOR DEPT OF CHEMISTRY
A POLAROGRAPHIC METHOD FOR FOLLOWING THE RATES OF CHOLINESTERASE-CATALYZED HYDROLYSES OF ACETYLTHIOCHOLINE,
by Thomas H. Ridgway, and Harry B. Mark,Jr.. 11 Feb 65, 10p. Contract DA31 124ARO D284 AROD , 5092:3
Unclassified report

Pub. in Analytical Biochemistry v12 n2 p357-66 Aug 65 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Polarographic analysis, Reaction kinetics), (*Acetylcholine, Hydrolysis), Cholinesterase, Acetylcholinesterase, Cholinesterase inhibitors, Parasympathomimetic agents, Organic sulfur compounds

A rapid and simple polarographic method for following the rates of the cholinesterase-catalyzed hydrolysis of acetylthiocholine and the rates of inhibition of this hydrolysis is described. This method has the advantage that it can follow quite rapid reactions, as meaningful data can be obtained after 10 sec of mixing of the solutions. The method follows the rate of increase of the anodic polarographic wave of thiocholine produced by the hydrolysis. The validity of the method was determined by comparing the rates of production of thiocholine spectrophotometrically and polarographically. Also the values of K sub m for the hydrolysis, and K sub m and K sub I for the inhibition reaction of neostigmine were determined and compared to values reported in the literature. (Author)

AD-621 635 See Fld. 10

AD-621 671 See Fld. 6/16

AD-621 813 See Fld. 6/16

AD-621 929 See Fld. 6/13

AD-622 139 See Fld. 5/10

AD-622 141 See Fld. 6/16

6/3. BIOLOGY

AD-621 681 Div. 16/4
PACAF EPIDEMIOLOGICAL LAB SAN FRANCISCO CALIF 96274 EPIDEMIOLOGICAL FLIGHT (5TH)
NOTES ON THE OPERATION OF A LIGHT TRAP IN CENTRAL LUZON, PHILIPPINE ISLANDS,
by Warren F. Pippin. 1965, 5p.
Unclassified report

Pub. in Mosquito News v25 n2 p183-7 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Insect control, Containers), (*Culicidae, Insect control), Pest control, Disease vectors, Light, Philippines, Operation, Flight, Night flight

During a mosquito survey of Clark Air Base, Pampanga, Luzon, Philippine Islands, a New Jersey type light trap was operated for a period of one year. Of the 16 genera and 244 species of mosquitoes reported from the Philippines, seven genera and 42 species were collected in the trap. Fifty-one percent of the mosquitoes collected were Culex species and 46 percent Anopheles species. The three most common Anopheles collected were A. subpictus indefinitus (Ludlow), A. vagus limosus King and A. peditaeniatus (Leicester). A. minimus flavirostris (Ludlow), a primary vector of malaria in the Philippines, was not collected in the light trap. Evening flight activities of mosquitoes showed that most were collected between 6-8 p.m. Culex tritaeniorhynchus summorosus, a probable vector of Japanese encephalitis virus in the Philippines, appeared to be most active between 6-7 p.m. The most mosquitoes per trap night were collected during March of the hot-dry season. This can be explained by the tremendous increase of Anopheles subpictus indefinitus during this period. With the exception of this one Anopheles the mosquito population was heaviest during the rainy season (July-Sept). Culicine populations peaked during September, the month of heaviest rainfall. Anopheline populations declined during that period. Lowest mosquito activity was in the months of January, February and May. (Author)

AD-621 775 Div. 16/4
BRITISH COLUMBIA RESEARCH COUNCILVANCOUVER
REACTION OF FLYING MOSQUITOES TO VARIOUS STIMULI,
by R. H. Wright, P. N. Daykin, and F. E. Kellogg. 1964, 2p.
Unclassified report

Pub. in Proceedings of the International Congress of Entomology (12th) p281-2 1965 (Copies available only to DDC users).

Descriptors: (*Culicidae, Flight), (*Aedes, Sensory perception), Insect repellants, Central nervous system, Temperature, Carbon dioxide, Convection, Behavior, Chemoreceptors, Bites + stings, Stimulation, Canada

AD-621 944 Div. 16/4
CFSTI Prices: HC $1.00 MF $0.50
ARMY MEDICAL LAB (1ST) NEW YORK
A STUDY OF THE PROTEIN DIFFERENCES IN DDT RESISTANT AND NON-RESISTANT GERMAN ROACHES OR HOUSE FLIES.
Final rept.,
by J. I. Frea, and R. Singleton,Jr.. Sep 65, 6p.
Proj. 3A025601A806 01 ,3A014501B71P
Unclassified report

Descriptors: (*Blattidae, Proteins), (*Muscidae, Proteins), Electrophoresis, Insecticides, Lipids, DDT

Techniques have been developed whereby good yields of cell-free, lipid body free extracts of German Roaches can be obtained. Electrophoresis of these extracts using the high resolution technique of Ornstein and Davies shows several bands

present in the resistant strain which were not present in the non-resistant strain. These bands appeared in what is normally the far Beta or early Gamma region of the electrophoretogram. Attempts to isolate these bands after electrophoresis have thus far been unsuccessful, therefore a characterization of the proteins involved has not been made. Fractionation of the roach extracts of Sephadex G-100 have shown very definite strain differences. However further quantitation of these differences has not been possible at this time. (Author)

AD-621 981 Div. 16/4
TEL-AVIV UNIV (ISRAEL) DEPT OF ZOOLOGY
CONTRIBUTIONS TO THE KNOWLEDGE OF THE RED SEA. NO. 31. OBSERVATIONS AND EXPERIMENTS ON THE RED SEA ANEMONES AND THEIR SYMBIOTIC FISH AMPHIPRION BICINCTUS,
by L. Fishelson. Mar 64, 14p. Contract N62558 2984 ,N62558 3335

Unclassified report

Pub. in Sea Fish Res. Stat. Haifa, Bull. v39 p1-14 1965 (Copies available only to DDC users).

Descriptors: (*Red Sea, Aquatic animals), (*Aquatic animals, Invertebrates), Fishes, Morphology (Biology), Ecology, Behavior, Coral reefs, Life cycle, Food, Eggs, Larvae, Israel

Over a period of seven years, observations have been taken on Amphiprion bicinctus and the two anemones with which it lives symbiotically in the littoral zone of Eilat, Gulf of Aqaba. The larger and more common anemone, Stoichactis sp., is permanently anchored in coral crevices, the second, unindentified species (probably Antheopsis koseirensis) burrows in the sand. The anemones are essential to the survival of A. bicinctus: driven away from its host the fish proves to be a poor swimmer and falls prey to other animals; within the tentacles it finds shelter. On the other hand, the fish actively feeds the anemone. Given a morsel too large for it to swallow, a hungry fish will share the food with the anemone by sticking it on the the tentacles and pulling off a part. The young A. bicinctus, 4 cm or less in length, live in schools closely associated with the host anemone; larger fish are dispersed with one to three per anemone, and during mating they are living one pair only per host. At all stages the fish defend their territory, but they are especially fierce during the reproduction period. Various aspects of behaviour in A. bicinctus are described: settling on the host-anemone, behaviour in the absence of a host, cleaning, fighting and mating movements. Finally, some details on spawning and care of the eggs, and the larvae and fry of 11-12 cm length have been briefly described.

AD-622 210 Div. 16/4 ,16/14
CFSTI Prices: HC $5.00 MF $1.00
MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY
INDEX CATALOGUE TO RUSSIAN, CENTRAL AND EASTERN EUROPEAN, AND CHINESE LITERATURE IN MEDICAL ENTOMOLOGY. VOLUME VII. PROTOZOAN DISEASES.
1965, 184p. Contract DA49 193MD2238 TT , 65-64118

Unclassified report

Descriptors: (*Indexes, Protozoa), (*Protozoa, Diseases), Plasmodium, Hemosporifia, Leishmania, Toxoplasma, Trypanosoma, Veterinary Medicine, Disease vectors, Parastic diseases, Epidemiology, Etiology, Ecology, Public health, USSR, Eastern Europe, China

AD-621 946 See Fld. 9/1

6/5. CLINICAL MEDICINE

AD-621 709 Div. 16/13
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES DEPT OF SURGERY
MYOSITIS OSSIFICANS TRAUMATICA: THE MECHANISM OF LOCALIZATION OF THE CALCIUM DEPOSITS IN MUSCLE CELLS.
Annual progress rept. for 1 Mar 65-28 Feb 66, by Marshall R. Urist. 10 Oct 65, 3p. Contract DA49 193MD2556

Unclassified report

Descriptors: (*Muscles, Calcification), (*Calcification, Muscles), Calcium, Ions, X-ray diffraction analysis, Tissues (Biology), Radioactive isotopes, Cytoplasm, Cells (Biology), Injection (Medicine), Phosphorus, Phosphates, Rats

AD-621 838 Div. 16/13,16/10
CALIFORNIA UNIV BERKELEY
EXPERIMENTAL INTRACELLULAR CALCIFICATION OF MUSCLE
by Donald P. Speer, and Marshall R. Urist. 1964, 19p. Contract DA49 193MD2556 ,AT11 1 34

Unclassified report

Pub. in Clinical Orthopaedics n39 p213-31 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Calcification, Muscles), (*Muscles, Calcification), Calcium, Phosphorus, Ions, Cells (Biology), Cytoplasm, Tissues (Biology), Radiography, Histological techniques, Radioactive isotopes, Photomicrography, Biological stains, Adenosine phosphates, X-ray diffraction analysis, Injection (Medicine), Glycogen

The local mechanism of calcification was investigated in (1) small samples of muscle saturated with calcium ions in inorganic solutions in vitro, (2) the intact quadriceps following injections of calcium and other ions in the living animal. Muscle treated in solutions of 25 mM/L of calcium chloride for 1 hour in vitro and fixed in 70 per cent alcohol did not produce alizarin dye lake precipitation or an x-ray diffraction pattern of apatite but showed very fine granules of silver staining organic material in the myoplasm. This was present after as well as before decalcification of the tissue and therefore was not a von Kossa metal substitution reaction for calcium carbonate or calcium phosphate salts. Instead, it was presumed that Ca (++) liberated anionic reactive groups and concurrently produced soft-tissur calcium complexes. When muscle containing such calcium complexes was treated in phosphate buffer, a typical von Kossa reaction for inorganic calcium phosphate was obtained, and this was removable by decalcification of the tissue. Intramuscular injections of 25 mM/L CaC12, containing radioactive calcium (Ca45), produced selective intracellular binding of calcium and subsequently calcification of the cytoplasm. A period of 4 hours elapsed before there was sufficient deposit to form a dye lake with alizarin or diffract roentgen rays to produce the pattern of apatite mineral.

AD-622 142 Div. 16/5 ,16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C DENTAL AND ORAL PATHOLOGY DIV
ACINIC CELL ADENOCARCINOMA OF THE MAJOR SALIVARY GLANDS. A CLINICOPATHOLOGIC STUDY OF 77 CASES,
by Albert M. Abrams, John Cornyn, Henry H. Scofield, and Louis S. Hansen. 16 Mar 65, 18p.

Unclassified report

Pub. in CANCER V18 n9 p1145-62 Sep 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cancer, Salivary glands), (*Salivary glands, Cancer), Mouth, Pathology, Histology, Morphology (Biology), Biological stains, Histological techniques, Medical examinations, Neoplasms, Diagnosis, Therapy, Cells (Biology), Growth

Clinical features, histomorphologic characteristics and therapeutic results for 77 acinic cell adenocarcinomas on file at the Armed Forces Institute of Pathology are analyzed and compared with findings reported in the literature. The acinic cell adenocarcinomas in this study arose almost exclusively in the parotid gland, occurred most frequently during the third decade and were most common in females. Clinically, they were usually indistinguishable from benign salivary gland tumors; pain and attachment to deep structures were ominous characteristics, however. Their histomorphologic picture was more varied than indicated in the literature. Five variations of tumor cells and 4 patterns of growth, including a previously unreported follicular pattern, are described. Lymphoid reaction, microscopic encapsulation or lesions growing entirely as a few large papillary cystic areas seem to indicate a favorable prognosis. The special stains employed in this study are considered little aid in differentiating acinic cell adenocarcinomas from other tumors of salivary gland origin. Evidence is presented favoring origin from intercalatedduct cells rather than serous acinar cells. Follow-up data on 72 patients revealed that 61 had no recurrences or metastasis; 6 developed local recurrences only and 5 had metastatic lesions. (Author)

AD-622 157 Div. 16/7 ,16/10
PHILADELPHIA GENERAL HOSPITAL PA DEPT OF PEDIATRICS
INTRACARDIAC PHONOCARDIOGRAPHY IN THE DIAGNOSIS OF LARGE PATENT DUCTUS ARTERIOSUS IN EARLY INFANCY,
by A. N. Moghadam, Elhamy F. Khalil, and Leone F. Mattioli. 1965, 9p. Contract N1H HEO7415 Proj. NR102 470

Unclassified report

Pub. in The Journal of Pediatrics v67 n2 p214-21 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Infants, Cardiovascular diseases), (*Cardiovascular diseases, Infants), Heart, Diagnosis, Medical examination, Electrocardiography, Cannulation, Therapy

The cases of 10 infants under 6 months of age with ausculatory findings of systolic murmur and the diagnosis of large patent ductus arteriosus and congestive heart failure are presented. The diagnosis was based on right heart catheterization and intracardiac phonocardiography, which showed a continuous murmur inside the pulmonary artery in all but one case. The diagnosis was confirmed at the time of operations, and associated anomalies were excluded by careful follow-up studies. The value of intracardiac phonocardiography in the diagnosis of this lesion is discussed. (Author)

AD-622 211 Div. 16/13
HARRISON DEPT OF SURGICAL RESEARCH UNIV OF PENNSYLVANIA PHILADELPHIA
PREFERENTIAL CEREBRAL HYPOTHERMIA FOR CIRCULATORY ARREST,
by S. K. Wolfson,Jr., W. Y. Inouye, A. Kavianian, M. V. Icoz, and W. M. Parkins. 2 Mar 64, 11p. Contract DA49 007MD511 Grant ,PHS HE08066 01

Unclassified report

Pub. in Surgery v57 n6 p846-55 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hypothermia, Cerebral cortex), (*Blood circulation, Hypothermia), (*Cerebral cortex, Blood circulation), Surgical techniques, Heart, Brain, Tolerances (Physiology), Anoxia, Dogs

A procedure has been described that employs preferential cerebral hypothermia after induction of circulatory arrest. Extra-corporal circulation, pump oxygenator, heat exchangers, and donor blood are not required. Normothermic animals have tolerated 20 minutes of circulatory arrest without injury and 40 minutes with spinal cord but no cerebral injury. Animals previously cooled to moderately hypothermic levels have survived 60 minutes of arrest without clinical signs of injury. In the latter group, half the animals subjected to 105 minutes of arrest survived, but sustained brain damage. A procedure for the treatment of emergency cardiac arrest or cardiopulmonary bypass failure was described. Factors influencing the experimental results as well as the possibility of clinical applications to elective cardiac and neurosurgery were discussed. (Author)

6/8. FOOD

AD-621 921 Div. 29/2 ,16/2
CFSTI Prices: HC $1.00 MF $0.50
OREGON STATE UNIV CORVALLIS
RESISTANCE OF MICROORGANISMS TO IONIZING RADIATION APPLIED TO FOODS.
Final rept. for Jun 62-Sep 63,
by A. W. Anderson. Sep 65, 21p. Contract DA19 129QM2035 Proj. 7 84 01 002
FD , 24

Unclassified report

Descriptors: (*Irradiated foods, Clostridium botulinum), (*Clostridium botulinum, Irradiated foods), (*Radiation effects, Clostridium botulinum), Beef, Containers, Additives, Sodium compounds, Nitrates, Nitrites, Chlorides, Biological contamination, Spores, Toxins + antitoxins, Odors, Radiological dosage, Inhibition, Viability

Spores of Clostridium botulinum (33A) were inoculated into canned ground beef containing various additives and subsequently irradiated. Sodium nitrate (1000 ppm) plus sodium chloride (2.5%) completely inhibited spoilage for 120 days at 35C when samples were exposed to 2.0 Mrad, and no viable spores or toxin were recovered upon subculture. One hundred and twenty five cans were used per run. The use of either additive, with or without radiation, did not prevent spoilage unless higher levels of radiation such as 2.5 and 3.0 Mrad were used, with the concomitant production of undesirable odors. Sodium nitrite (200 ppm) plus sodium chloride (2.5%) inhibited spoilage for 120 days but there was evidence of spore viability and toxin production in some of the unspoiled cans when the radiation level was 2.0 Mrad. Higher levels of radiation gave results similar to those obtained for sodium nitrate and sodium chloride. (Author)

AD-622 087 Div. 29/2
CFSTI Prices: HC $4.00 MF $1.00
GENERAL FOODS CORP WHITE PLAINS N Y TECHNICAL CENTER
FUNDAMENTAL ASPECTS OF MEAT TEXTURE.
Technical rept.,
by D. DeFelice, Alina Szczesniak, D. Gardner, E. Farcas, and K. Sloman. Aug 65, 134p. Contract DA19 129QM1844 01 5147
USA NLABS , FD-17

Unclassified report

Descriptors: (*Dehydrated foods, Meat), (*Meat, Dehydrated foods), Acceptability, Beef, Freeze drying, Mastication, Hardness, Elasticity, Viscosity, Adhesion, Particle size, Moisture, Fats, Taste, Measurement

The report summarizes work done over a four year period on the suitability of the General Foods Texturometer (I) for meat texture description and its comparison with the Warner-Bratzler Tenderometer (II) and the Kramer Shear Press (III). Parameters of hardness, cohesiveness, elasticity, chewiness and water release measurable on I were found applicable to fresh and freeze-dehydrated meats (beef, pork, turkey, fish, comminuted meat). Correlations of I with panel and with II and III varied in significance depending on variables incorporated into the sample design and were related to the range of values covered. All three instruments correlated highly significantly with sensory tenderness and with each other; however, they could not be considered good predictors of tenderness. None correlated consistently with sensory juiciness. Sensory overall texture ratings could be described in terms of tenderness and juiciness. When several parameters were combined, I was superior to the other instruments in that it could account for up to 90% variation in sensory overall texture. However, the nature of equations and contributions of individual parameters varied depending on sample set. All three instruments were able to differentiate between important sample processing variable incorporated into the experimental design. In general, I appeared to be the most, and II the least sensitive to defining these differences. (Author)

AD-622 201 Div. 29/2 ,16/9
CFSTI Prices: HC $2.00 MF $0.50
ARMY MEDICAL NUTRITION LAB CHICAGO ILL
NUTRITION SURVEY OF A COMPANY MESS, FORT SHERIDAN, ILLINOIS, 9-13 AND 23-27 JUNE 1952,
by E. M. Parrott, T. E. Friedemann, C. F. Consolazio, W. J. Kuhl, Jr., and W. R. Best. 27 Aug 52, 44p. Rept. no. 100

Unclassified report

Descriptors: (*Military rations, Nutrition), (*Nutrition, Military rations), Military facilities, Food, Diet, Chemical analysis, Fats, Proteins, Carbohydrates, Food dispensing, Graphics, Tables

The object of the study was to evaluate the adequacy of the diet served at a company mess, to devise and study methods for accurate sampling and chemical analysis of the food offered, and the plate, kitchen, fat, and preparation wastes; to compare the data on food consumption as determined by chemical analysis with those obtained by inventory, using the 'short' and 'long' methods of calculation; and to determine the adequacy of the tables used in calculation of the nutrient content of the Master Menu.

6/9. HYGIENE AND SANITATION

AD-621 648 **See Fld. 6/16**

6/12. MEDICAL AND HOSPITAL EQUIPMENT AND SUPPLIES

AD-621 632 Div. 16/8 ,16/10,30/3
ARMY RESEARCH INST OF ENVIRONMENTAL MEDICINE NATICK MASS
CELLULOSE ACETATE MEDIA IN IMMUNOCHEMICAL TECHNICS, APPARATUS AND APPLICATION,
by M. P. Feinberg, Lewis T. Mann, Jr., and W. F. Blatt. 30 Jan 65, 6p.

Unclassified report

Pub. in American Journal of Clinical Pathology v44 n2 p177-81 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrophoresis, Laboratory equipment), (*Cellulose acetates, Electrophoresis), Immunology, Antigen + antibodies, Blood serum, Immune serums, Pathology

An inexpensive modification which permits the Beckman Model R paper electrophoretic system to be used for cellulose acetate immunoelectrophoresis has been developed. Technics for embossing acetate membranes (much like the troughs and wells cut in agar) for the simplified application of antigen and antiserums are described, as well as representative applications of this system to immunoelectrophoresis. (Author)

AD-622 130 Div. 16/8 ,16/2
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DIV OF BASIC SURGICAL RESEARCH
EVALUATIONS OF A PATIENT ISOLATOR SYSTEM. II. DISTRIBUTION PROFILES OF PATIENT MICROFLORA DURING PROLONGED ISOLATOR CONFINEMENT,
by S. Shadomy, Miriam K. Ginsberg, and E. Zeiger. 7 Apr 65, 10p.

Unclassified report

Pub. in the Archives of Environmental Health, v11 p191-200 Aug 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Infectious diseases, Therapy), (*Hospitals, Biological contamination), Medical equipment, Medical supplies, Soaps, Germicides, Skin, Bacteria

A patient was bacteriologically monitored during a 12-day period of confinement within a patient isolator. The combined effects of isolation and antimicrobial skin cleansing agents upon the normal cutaneous microflora were examined. Data derived from daily microbiological examination of selected cutaneous and body orifice microflora revealed the following: Use of a soap containing 2% hexachlorophene affected only a temporary reduction in the skin microflora; maximum reduction was obtained with a 3% hexachlorophene lotion. Repopulation of bacteriologically denuded skin surfaces was due primarily to recolonization by organisms of enteric origin; no repopulation by organisms of respiratory origin was detected. The indirect transmigration of enteric microorganisms to nonperineal surfaces was demonstrated. At no time was there bacteriological evidence of a failure in the microbial barrier of the isolator. (Author)

6/13. MICROBIOLOGY

AD-621 744 Div. 16/2
CFSTI Prices: HC $6.00 MF $1.25
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PHAGE TYPING OF BACTERIA,
by M. D. Krylova. 15 Sep 65, 254p. Rept. no. FTD-TT-65-113
TT , 65-64035

Unclassified report

Unedited rough draft trans. of mono. Fagotipirovanie Bakterii, Moscow, 1963 200p.

Descriptors: (*Bacteriophages, Infectious diseases), (*Bacteria, Classification), Enterobacteriaceae, Salmonella, Staphylococcus, Pseudomonas aeroginosa, Corynebacterium diphtheriae, Dysentery, Cholera, Culture media, Diagnosis, Antigens + antibodies, Epidemiology, USSR

The current state of the problem of the application of bacteriophages for the intraspecies identification of bacteria is presented. The methods of phage typing of the typhoid, paratyphoid B, Salmonella Breslau, staphylococci, dysentery and enteropathogenic coliform bacteria are described in detail. The theoretical aspects of the method of phage identification (specificity of phage type, adaptation mechanisms of phages etc.) are discussed. The report is destined for scientific workers in the field of microbiology, epidemiology and for practical physicians. (Author)

AD-621 765 Div. 16/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES
LIGHT-INDUCED ABSORBANCY CHANGES IN EIMHJELLEN'S RHODOPSEUDOMONAS,
by A. S. Holt, and Roderick K. Clayton. 22 Apr 65, 3p. Rept. no. NRC-8404
Unclassified report

Pub. in Photochemistry and Photobiology v4 p829-34 1965 (Copies available only to DDC users).

Descriptors: (*Bacteria, Absorption spectrum), (*Pseudomonadales, Absorption spectrum), (*Chlorophylls, Absorption spectrum), Light, Photosynthesis, Band spectrum, Atomic energy levels, Excitation, Canada

Light induced absorbancy changes in Rhodopseudomonas sp. NHTC 133 are analogous to those observed in other photosynthetic bacteria, but all of the features in the light-induced difference spectrum (except those reflecting cytochrome oxidation) are shifted to greater wavelengths. This general shift is consistent with the fact that the bacteriochlorophyll of this organism (BChl b) differs from the usual BChl in that its absorption bands are shifted to greater wavelengths. The singlet excited state of P985 (the counterpart of the P870 of Rhodopseudomonas spheroides) is not an energy sink relative to the major component of BChl b in vivo. The absorption maximum of P985 is at 985 millimicrons, whereas that of CBhl b in vivo is at 1012 millimicrons. (Author)

AD-621 839 Div. 16/2
USAF EPIDEMIOLOGICAL LAB LACKLAND AFB TEX
PRELIMINARY CHARACTERIZATION OF BACTERIOPHAGE SPECIFIC FOR THE TRIBE MIMEAE,
by L. E. Blouse, and R. Twarog. 1964, 1p.
Unclassified report

Pub. in Bacteriological Proceedings, 1964.

Descriptors: (*Bacteriophages, Brucellaceae), Culture media, Immune serums, Growth, Preparation

Bacteriophage specific for members of the tribe Mimeae have not been described previously. This report describes the isolation and partial characterization of several phages active against the Mima-Herellea group. Phage stocks prepared by broth cultrue and agar-overlay techniques ranged from 2 x 10 to the 9th power to 5 x 10 to the 11th power plaque-forming units per ml. The following results were obtained from studies conducted on phage isolated against H. vaginicola ATCC 11959, 9956; Walter Reed strains H499, T-1; and a clinical isolate 62819. Serum inactivation constants were carried out at 37C in Trypticase Soy Broth (TSB). Values of 304, 150, 107, and 70/min were obtained for phages 9956, H499, 11959, and T-1, respectively. Two phages exhibiting different plaque types were isolated against 62819; 'C' by centrifugation and 'F' by filtration. The inactivation constant for 'F' is 55/min. The only heterologous antiphage activity was that of 11959 antiserum inactivating phage 62819F at the rate of 19/min. The thermal stability of these phages is: T-1 > 11959 > 62819F > H499. The proportion of H499 phage surviving 10-min exposure to 51C was 0.05, while the remainder were stable. Growth studies at 37C revealed latent periods varying from 21 min for T-1 to 32 min for 11959. The average burst varied from 75 (62819F) to 160 (T-1). The phages were genus-specific and did not attack several strains of M. polymorpha. In addition, phages isolated against three strains of M. polymorpha were specific for their host.

AD-621 929 Div. 16/2 ,16/3
TEMPLE UNIV PHILADELPHIA PA DEPT OF MICROBIOLOGY
ROLE OF AMINO ACIDS IN POSTEXPONENTIAL GROWTH,
by Gerrit Toennies. 17 Apr 65, 6p. Contract Nonr273100 ,Nonr380603
Unclassified report

Pub. in Journal of Bacteriology v90 n2 p438-42 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Amino acids, Growth), (*Streptococcus, Amino acids), Culture media, Cells (Biology), Cytoplasm, Cell wall, Membranes (Biology), Proteins, Synthesis

It was shown earlier that depletion of different essential amino acids from the medium of growing streptococcus faecalis leads to the formation of cell types of different compositions in terms of cytoplasm, wall, and membrane. The findings presented now indicate that these postexponential effects can be induced by very low concentrations of incomplete amino acid complements, that cystine and methionine have major and separate effects, and that these effects may be modulated differentially by the presence of different combinations of other amino acids. (Author)

AD-622 128 Div. 16/2
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C
EPIDEMIOLOGY OF MENINGOCOCCAL MENINGITIS AT FORT ORD,
by John R. Gauld, Robert E. Nitz, Donald H. Hunter, James H. Rust, and Ross L. Gauld. 12 Feb 65, 18p.
Unclassified report

Pub. in American Journal of Epidemiology v82 n1 p56-72 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Neisseriaceae, Diseases), (*Military medicine, Epidemiology), Military facilities, Army personnel, Medicine, Medical examination, Drugs, Dosage, Culture media, Sulfadiazine, Sensitivity

Circumstances leading to the highly prevalent sulfonamide-resistant strains of meningococci at Fort Ord are described and the use and limitations of mass prophylaxis are discussed. It is concluded that the high prevalence of resistant strains was developed on the post as a result of extensive use of sulfadiazine. The responses of both sensitive and resistant meningococci to prophylactic sulfadiazine were studied and it is believed that mass prophylaxis with sulfadiazine is contraindicated if the predominating strains are resistant. Spread of the meningococcus through a recruit population was studied in both cross-sectional studies of the post and in longitudinal studies of companies selected at random. It was found in the latter study that, even though no sulfadiazine had been used on the post in the 4 preceding months, sulfonamideresistant strains still predominated. Most of the resistant strains cultured were group B while most of the sensitive strains were group C. The group B strains tended to parasitize the nasopharynx for longer periods than the group C strains. The procedures indicated for the control of meningitis in the face of resistant strains are discussed. (Author)

AD-622 129 Div. 16/2
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C
PROTECTION OF MONKEYS AGAINST EXPERIMENTAL SHIGELLOSIS WITH ATTENUATED VACCINES,
by Samuel B. Formal, E. H. LaBrec, Amos Palmer, and Stanley Falkow. 6 Feb 65, 7p.
Unclassified report

Pub. in Journal of Bacteriology v90 n1 p63-7 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with National Institutes of Health, Bethesda, Md.

Descriptors: (*Shigella, Vaccines), Shigella flexneri, Mutations, Diseases, Escherichia coli, Dosage, Antigens + antibodies, Immunity, Monkeys

Two Shigella flexneri 2a strains of reduced virulence were used as oral vaccines to protect monkeys against experimental challenge. One strain, a spontaneous mutant, had lost its ability to cause disease and was unable to penetrate the intestinal epithelium and reach the lamina propria. The other strain was a hybrid obtained by mating virulent S. flexneri 2a with Escherichia coli. This hybrid strain retained the capacity to penetrate the intestinal epithelium but was not able to maintain itself in the lamina pop a. Five oral doses of the nonpentrating mutant strain were required to render monkeys resistant to experimental challenge, but a single dose of the hybrid strain sufficed to protect the animals. There was some evidence that a degree of specificity was involved in the induced resistance, although neither vaccine evoked a consistent serum antibody or a detectable coproantibody response. (Author)

AD-622 132 Div. 16/2
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DEPT OF SEROLOGY
SOLUBLE ANTIGEN FLUORESCENT-ANTIBODY TECHNIQUE,
by Andre J. Toussaint, and Robert I. Anderson. 22 Feb 65, 7p.
Unclassified report

Pub. in Applied Microbiology v13 n4 p552-8 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Antigens + antibodies, Test methods), Serum albumin, Solutions, Fluorescence, Fluorometers, Chromatographic analysis

An indirect fluorescent-antibody (FA) procedure employing soluble antigen fixed onto an artificial matrix was developed, and a mechanical means for reading of test results was devised. The method employs two small cellulose acetate paper discs for each test. One disc contains soluble antigen diluted in 1% bovine serum albumin (BSA); the other contains only 1% BSA and serves as a control. After testing by the indirect FA procedure, the results of the tests are read on a fluorometer fitted with a paper chromatogram door. The instrument is set at zero with the control disc as a blank, and the specific fluorescence of the antigen disc is determined. Findings obtained with homologous and heterologous antisera indicated that the method yields excellent results. The soluble antigen fluorescent-antibody technique has definite advantages over the conventional indirect FA procedures. (i) The investigator may objectively select the antigen to be employed. (ii) It is possible to obtain objective mechanical reading of test results rather than the highly subjective readings required by conventional methods. (iii) The system compensates for any nonspecific fluorescence contributed either by the serum (e.g., drugs) or by free fluorescein in the conjugated antiserum. (Author)

AD-622 137 Div. 16/2 ,16/11
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DEPT OF MICROBIOLOGY
USE OF ANTIBIOTICS IN THE PREPARATION OF CANINE KIDNEY TISSUE CULTURE VACCINES TO ELIMINATE LEPTOSPIRAL INFECTION HAZARDS,
by D. Ellison, J. Rigg, S. J. McConnell, A. D. Alexander, and R. H. Yager. 10 Mar 65, 6p.
Unclassified report

Pub. in Applied Microbiology v13 n4 p595-9 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Tissue culture, Vaccines), (*Leptospira, Tissue culture), (*Antibiotics, Tissue culture), Kidneys, Preparation, Tissue culture cells, Infectious diseases, Viability, Growth, Penicillins, Streptomycins, Polymyxins, Neomycins, Chloramphenicol, Dogs

The potential leptospiral infection hazard in the use of vaccines prepared from canine kidney monolayer cultures was studied. Cell cultures were prepared from kidneys of dogs experimentally infected with Leptospira serotype canicola. Viable leptospires were found in kidney cell suspensions at the time of seeding, surviving trypsinization either at room temperature for approximately 2 hr or overnight at 4 C, even in the presence of antibiotics. In tissue cultures maintained without antibiotics, leptospires were cultured up to the time of involution of cells at 25 to 34 days of incubation. Cytopathogenic effects of leptospires on cultured kidney cells were not noted; neither was growth of leptospires remarkable. The addition of either a combination of penicillin (100 units per ml) plus streptomycin (100 micrograms/ml) or polymyxin B (50 units per ml) plus dihydrostreptomycin (100 micrograms/ml) to seeding cell suspensions resulted in the elimination of viable leptospires by the 4th hr of incubation. From cell cultures treated with neomycin (100 micrograms/ml) or chloramphenicol (100 micrograms/ml), leptospires were recovered, respectively, after 24 and 48 hr, but not thereafter. It was apparent that antibiotics, particularly the combination of polymyxin B and dihydrostreptomycin, could be effectively used to eliminate leptospires in tissue culture. Other antibiotics with known antileptospiral activities probably would be effective also. If antibiotics are not used in canine kidney tissue culture employed for viral vaccine preparations, rigid testing for the presence of leptospires in donor dogs and tissueculture vaccine is indicated. (Author)

AD-622 147 Div. 16/2
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
PRELIMINARY INVESTIGATIONS ON CHAGAS' DISEASE,
by Donald J. Winslow, and Elmer F. Chaffee.
1965, 10p. Proj. 6X61 01 001 01
Unclassified report

Pub. in Military Medicine v130 n8 p826-34 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Trypanosoma, Diseases), Pathology, Parasitic diseases, Humans, Infection, Etiology, Ganglia, Nerve cells, Heart, Brain, Muscles, Nervous system, Histological techniques, Public health, South America

Conclusions: Chagas' disease is an important unsolved public health problem that is not only of considerable economic significance in large parts of South America but may threaten visitors to endemic areas and might conceivably spread to human populations in the U.S.A. in the wake of decreasing geographic barriers. The pathogenesis of chronic Chagas' disease is particularly related to damage to the heart muscle and the nervous system during the acute stage of the disease. The greatest disability and most important cause of death is the severe chronic heart disease. Up to the present time, methods of prevention in endemic areas are inadequate, and no chemotherapeutic agent has been found effective against the intracellular form of the parasite. (Author)

AD-621 645 **See Fld. 6/16**

AD-621 858 **See Fld. 6/15**

AD-621 921 **See Fld. 6/8**

AD-621 928 **See Fld. 6/1**

AD-622 130 **See Fld. 6/12**

6/15. PHARMACOLOGY

AD-621 768 Div. 16/11
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
ACUTE EFFECTS OF EXPOSURE TO HYDRAZINE AND HYDRAZINE DERIVATIVES ON RENAL FUNCTION IN THE DOG,
by Ethard W. Van Stee. 1965, 4p.
Unclassified report

Pub. in Aerospace Medicine v36 n8 p764-7 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hydrazine, Urinary system), (*Hydrazine derivatives, Urinary system), Toxicity, Methyl hydrazines, Dimethyl hydrazine (1-1), Transport properties, Kidneys, Pathology, Histological techniques, Dogs

Dogs were exposed to approximately equimolar concentrations of hydrazine, methylhydrazine and 1,1-dimethylhydrazine. The dogs exposed to hydrazine developed significantly decreased PAH and inulin clearance rates and renal plasma flow rates during the first four hours post-exposure. The decreased glomerular filtration rate was attributed to the decreased renal plasma flow. The decreased PAH clearance was attributed to the decreased GFR and interference with active transport by the proximal renal tubular epithelium. The dogs exposed to methylhydrazine developed decreased PAH and inulin clearance rates. The mechanism producing impairment of renal function following exposure to methylhydrazine was postulated to be similar to the hydrazinetreated group. Exposure to UDMH caused no significant impairment of renal function measurable by these technics. (Author)

AD-621 858 Div. 16/11,16/2
NAVAL MEDICAL RESEARCH UNIT NO 4 GREAT LAKES ILL
PROTECTION OF A MILITARY POPULATION FROM RHEUMATIC FEVER,
by Paul F. Frank, Gene H. Stollerman, and Lloyd F. Miller. 1965, 9p.
Unclassified report

Pub. in Journal of American Medical Association v193 n10 p775-83 Sep 6 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Naval personnel, Rheumatic diseases), (*Rheumatic diseases, Naval personnel), (*Military medicine, Rheumatic diseases), Penicillins, Streptococcus, Diseases, Injection (Medicine), Respiratory diseases, Dosage, Naval training

Types of prophylaxis programs employing benzathine penicillin G for the control of streptococcal disease among Navy recruits ranged from mass injections of penicillin in an attempt to interrupt epidemics to the yeararound administration of a single injection to new recruits coming to Great Lakes, Ill, in an effort to prevent epidemics. The latter proved to be the most feasible program for the streptococcal disease situation at Great Lakes. Most programs were over 90% effective. Untoward reactions to benzathine penicillin G occurred in less than 1% of the recruits and were of the serum-sickness type. No anaphylactic deaths were observed among the 315,000 men receiving the drug prophylactically over a nine-year period. (Author)

AD-621 899 Div. 16/11
CFSTI Prices: HC $1.00 MF $0.50
ALABAMA UNIV BIRMINGHAM SCHOOL OF CHEMISTRY METALLURGY AND CERAMICS
EVALUATION OF NATURAL PRODUCTS.
Final rept. for 1 Jul 63-30 Apr 65,
by O. D. Easterday, and I. Corman. 30 Apr 65, 17p. Contract DA18 108AMC255A
Unclassified report

Descriptors: (*Drugs, Biological products), (*Biological products, Drugs), (*Toxicity, Drugs), Plants (Botany), Eggs, Echinodermata, Fishes, Crustacea, Seeds, Microorganisms, Staphylococcus aureus, Escherichia coli, Bacillus subtilis, Solvent extraction, Tables, Dosage, Tests

A report is presented on the Field Screen and Primary Screen for the evaluation of natural products. Fortyfour materials of the 1174 studied were recommended for testing in the Secondary Screen. It was recommended that five natural products be further purified and the active principle isolated. (Author)

AD-622 122 Div. 16/11,16/12
DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)
THE EFFECT OF AMINO-OXYACETIC ACID AND HYDROXYLAMINE ON RATS BREATHING OXYGEN AT HIGH PRESSURE,
by J. D. Wood, and W. J. Watson. 9 Sep 64, 8p.
Unclassified report

Pub. in Journal of Neurochemistry v12 p663-9 1965 (Copies available only to DDC users).

Descriptors: (*Toxicity, Oxygen), (*Oxygen, Poisoning), Convulsive disorders, Central nervous system, Amino acids, Oxygen consumption, Pressure breathing, Barometric pressure, Amines, Rats, Canada

The effect of intraperitoneal administration of aminooxyacetic acid and hydroxylamine on oxygen poisoning in rats, as measured by convulsions and deaths, was investigated. Amino-oxygacetic acid was without effect on the number of rats convulsing or dying from exposure to hyperbaric oxygen, although in some cases the number of animals severely convulsing was decreased. Hydroxylamine influenced the degree of oxygen poisoning, the direction of the change depending on the time between administration of the compound and the exposure of the animal. When the time interval was 5 min hydroxylamine enhanced oxygen poisoning, but when the interval was 60 min the amine reduced the toxic effects of oxygen at high pressure. This protection was maximal in the animals which had convulsed following the administration of hydroxylamine before being exposed to hyperbaric oxygen. The significance of the present findings is discussed with respect to theories put forward to account for oxygen poisoning. (Author)

AD-622 136 **See Fld. 7/3**

AD-622 137 **See Fld. 6/13**

6/16. PHYSIOLOGY

AD-621 625 Div. 16/1
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF MEDICINE
ELECTRON MICROSCOPIC STUDIES OF THE PROXIMAL TUBULE OF THE RAT KIDNEY. II. CYTOSEGRESOMES AND CYTOSOMES: THEIR RELATIONSHIP TO EACH OTHER AND TO THE LYSOSOME CONCEPT,
by Jan L. E. Ericsson, Benjamin F. Trump, and

Josef Weibel. 19 Apr 65, 26p. Contract DA49 193MD2379

Unclassified report

Pub. in Laboratory Investigation v17 n7 p1341-65 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Kidneys, Cells (Biology)), Cytoplasm, Mitochondria, Granules, Morphology (Biology), Phosphoric monoester hydrolases, Electron microscopy, Rats

The purpose of the report is to record observations on the mode of formation of cytosegresomes in normal proximal tubular cells and to present evidence indicating that during the degradation of the sequestered organelles, cytosegresomes are gradually transformed into cytosomes. The results are discussed with regard to the lysosome concept; to this end a critical analysis of the presnetly existing nomenclature concerning various types of cytoplasmic granules or inclusion bodies, presumed to contain acid phosphatase and represent 'lysosomes,' is included.

AD-621 628 Div. 16/10
GEORGE WASHINGTON UNIV WASHINGTON D C
GLUTARALDEHYDE FIXATION OF WHOLE EYES,
by Myron Yanoff, Lorenz E. Zimmerman, and Ben S. Fine. 27 Feb 65, 6p. Contract DA49 193MD2680 Grant ,PHS3T1NB5379 03S1

Unclassified report

Pub. in American Journal of Clinical Pathology v44 n2 p167-71 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Eye, Histological techniques), (*Histological techniques, Eye), Formaldehyde, Biological stains, Tissues (Biology), Nerve fibers, Mucopolysaccharides, Cytochemistry, Electron microscopy, Pathology

The effectiveness of glutaraldehyde fixation and formaldehyde fixation on whole eyes were compared. Glutaraldehyde fixation yielded generally superior results with fewer antifactitious changes, better preservation of histologic detail, and excellent staining of various tissue elements, including nerve fibers. Stains for acid mucopolysaccharides (alcian blue and colloidal iron) were somewhat more intensely positive after formaldehyde fixation than after glutaraldehyde fixation. With glutaraldehyde fixation, all tissues yielded strong Schiff reactions, but pretreatment of the sections with a solution of aniline largely restored and usual selectivity of the periodic acid-Schiff reaction. (Author)

AD-621 633 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
PSEUDOMELANOMA OF ANTERIOR CHAMBER CAUSED BY IMPLANTATION OF IRIS PIGMENT EPITHELIUM,
by Myron Yanoff, and Lorenz E. Zimmerman. 26 Mar 65, 4p. Contract N1H NB5379 03

Unclassified report

Pub. in Archives of Ophthalmology v74 p302-5 Sep 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Eye, Pathology), Neoplasms, Cancer, Diagnosis, Histology, Histological techniques, Ophthalmology

A unique case is reported in which an innocuous, pigmented cyst in the anterior chamber angle attached to the trabecular meshwork was mistaken for a malignant melanoma. A review of the literature revealed several descriptions of similar lesions, but none in which enucleation was performed because the cyst was mistaken for a melanoma. (Author)

AD-621 637 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
THE SIGNIFICANCE OF CYTOPLASMIC GRANULARITY IN THE PROGNOSIS OF RENAL CELL CARCINOMA,
by Gerald P. Murphy, and F. K. Mostofi. 9 Nov 64, 8p.

Unclassified report

Pub. in The Journal of Urology v94 p48-54 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cancer, Urinary system), Cytoplasm, Granules, Histology, Therapy, Diagnosis, Cells (Biology), Pathology, Tables

The prognostic significance of the appearance of cytoplasm of the tumor cell was studied in 279 patients with renal cell carcinoma. Some form of therapy was given to 154 patients who had no metastasis on admission. In this group, the 5-year cumulative mortality rate for granular cell tumors was 93 per cent compared to 74.6 per cent for clear cell tumors but no differences were observed for 10 and 15 years. Two other groups were also studied: 84 patients who received no treatment and 41 whose cases were diagnosed at autopsy. In all 3 groups, tumors with granular cells showed higher incidence of metastasis than those with clear cells; however, the number and distribution of metastases were the same for the 3 groups. (Author)

AD-621 638 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
ADENOMAS OF THE NIPPLE,
by Herbert B. Taylor, and Alexander G. Robertson. 8 Feb 65, 8p.

Unclassified report

Pub. in Cancer v18 n8 p995-1002 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mammary glands, Neoplasms), (*Neoplasms, Mammary glands), Pathology, Diagnosis, Histology, Cancer, Necrosis, Excision, Therapy, Histological techniques, Medical examination

The clinical and pathologic findings in a series of 29 patients with adenomas of the nipple are presented and compared with those of published studies. Scaling, crusting or ulceration of the nipple and a serosanguineous discharge are the most frequent presenting signs of this lesion, usually resulting in a clinical diagnosis of Pagent's disease. Histologically, the lesions comprised an overgrowth of ductal, papillary and solid epithelial structures growing within the nipple stroma and commonly extending to the overlying surface. The picture is suggestive of a carcinoma but the invariable presence of 2 cell types within the lesions and the lack of necrosis within the ducts are important features in the recognition of the proliferation as benign. Follow-up information was obtained on 28 of the 29 patients, none of whom had metastasis or other evidence of carcinoma. The lesion was excised locally in 18 instances and only one is known to have recurred. The recurrence was excised successfully so a conservative therapeutic approach seems fully justified. Because the tumors characteristically proliferate into the nipple stroma rather than into the lumen of lactiferous ducts and because histologically they resemble more closely certain adenomas of sweat gland origin than the usual intraductal papilloma or papillomatosis, the designation 'adenoma of nipple,' as advocated by Handley and Thackray, is favored. (Author)

AD-621 640 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
DIFFERENTIAL DIAGNOSIS, MACULAR LESIONS MISTAKEN FOR MALIGNANT MELANOMA OF CHOROID,
by Lorenz E. Zimmerman. 1965, 8p. Contract PHS NB5379

Unclassified report

Presented at the Annual Session of the American Academy of Opthalmology and Otolaryngology (69th), 18-23 Oct 64, Chicago, Symposium: Macular Diseases. Pub. in Transactions American Academy of Opthalmology and Otolaryngology p623-30 Jul-Aug 1965 (Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Eye, Pathology), (*Neoplasms, Eye), Diagnosis, Retina, Excision, Hemorrhage, Diseases, Medical examination, Ophtalmology

A variety of degenerative, inflammatory, harmartomatous, and traumatic lesions occurring in or about the macular area are often mistaken for malignant melanoma. These are typically small, usually measuring less than 2 to 3 disc diameters in their greatest dimension. Small lesions at the posterior pole should be considered nonmalignant until overwhelming evidence indicates otherwise. Hemorrhages or exudates, or both, in or about a small flat macular lesion should be considered as very convincing evidence that the lesion is not a melanoma, particularly if macular disease is present in the fellow eye. (Author)

AD-621 645 Div. 16/1 ,16/2
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF HYGIENE AND PUBLIC HEALTH
NATURE OF CYTOTOXIC REACTIONS MEDIATED BY ANTIBODY AND COMPLEMENT, AND RELATED PHENOMENA.
Semi-annual rept. for 1 Jul-31 Dec 52, by Manfred M. Mayer. 15 Jan 53, 7p. Contract Nonr24817

Unclassified report

Descriptors: (*Hemolysis, Immunology), (*Immunology, Antigen-antibody reactions), (*Antigen-antibody reactions, Hemolysis), Complement, Antigens ; antibodies, Erythrocytes, Calcium, Magnesium, Ions, Polymers, Immune serums

It has been possible to distinguish and physically separate two stages in the lysis of sensitized erythrocytes by complement, i.e., (1) a step involving interaction of complement with the sensitized cell, and (2) a subsequent step which appears to be an intrinsic cellular reaction. While the complement reaction (step 1) can be blocked by chelating agents such as citrate of ethylene diamine tetraacetate, as well as by competing complement-fixing antigen-antibody systems, the intrinsic reaction (step 2) is not arrested by these agents, nor by washing of sensitized cells following treatment with complement, nor by chilling to 0C. The intrinsic process has a low temperature coefficient (Q sub 10 about 1.5) and it proceeds at an appreciable rate even at 0C. Measurements conducted at 37C indicate that the intrinsic cellular reaction requires about 2-3 minutes per cell. This time interval, however, does not account adequately for the lag period, and it appears likely that the complement reaction proper (step 1) involves a series of 2 or more reaction steps. Evidence obtained in studies on the role of Ca (++) and Mg (++) in immune hemolysis supports this conclusion. (Author)

AD-621 648 Div. 16/1 ,16/10,16/6
CFSTI Prices: HC $4.00 MF $0.75
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
BIOLOGICAL EFFECTS OF MICROWAVES.
Compilation of abstracts.
17 Sep 65, 103p. Rept. no. ATD-P65-68 TT , 65-64023

Unclassified report

Rept. on Surveys of Soviet scientific and technical literature.

Descriptors: (*Microwaves, Radiobiology), (*Radiobiology, Microwaves), (*Electromagnetic waves, Radiobiolgoy), Central nervous system, Thyroid gland, Conditioned reflex, Motor reactions, Nerve cells, Cholinesterase, Reproduction (Physiology), Blood circulation, Gastrointestinal system, Blood cells, Nucleic acids, Heart, Brain, Mammals, Thresholds (Physiology), Medical examination, Industrial medicine, Therapy, Ultrahigh frequency, Superhigh frequency, High frequency, Low frequency, Dosimeters, Reviews, Abstracting, USSR

Contents: Hygienic and clinical aspects of microwaves (1937-1964); Experimental effects of microwaves (19551964); Effects of a constant magnetic field and low-frequency electromagnetic fields on higher nervous activity (19521964); Discussions and reviews on biological effects, experimental methods and mechanisms of the action of microwaves (1957-1964).

AD-621 651 Div. 16/1 ,6/5
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN
EFFECTS OF CONTINUOUSLY AND DISCONTINUOUSLY MOVING STIMULI ON THE LUMINANCE THRESHOLD OF A STATIONARY STIMULUS.
Revised ed.,
by Saul M. Luria. 5 Dec 64, 12p. Rept. no. 454 vol. 24 no. 10
NAVMED , MR005.14-1001-6.01
Unclassified report

Pub. in Journal of the Optical Society of America v55 n4 p418-25 Apr 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 8 Oct 1964.

Descriptors: (*Vision, Thresholds (Physiology)), (*Visual perception, Targets), Motion, Velocity, Luminescence, Stimulation, Inhibition, Target acquisition, Detection, Visual signals

The effects of a moving line of light on the luminance threshold of a stationary target in its path have been compared for continuous and interrupted movement with three luminances of the moving line, four speeds, and four widths of interruption of movement about the target position. For both the continuous and interrupted movement, the target threshold generally varied: (a) with the luminance of the line divided by its speed, and (b) with the temporal interval between the presentation of the target and the arrival of the moving line at the target position. At short temporal intervals, the rise in threshold with increasing luminance of the line was much greater than at long intervals. Although there were no substantial changes in the slopes of the functions, the point of maximum threshold rise was a function of speed. Both inhibitory and facilitative effects were magnified with very small interruptions of movement but decreased with larger interruptions. (Author)

AD-621 664 Div. 16/15,28/3 ,25/1
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
TIME-INTENSITY RELATIONS IN BINAURAL UNMASKING,
by H. S. Colburn, and N. I. Durlach. 15 Mar 65, 11p.
Unclassified report

Pub. in The Journal of the Acoustical Society of America v38 n1 p93-103 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hearing, Theory), (*Noise, Auditory perception), Thresholds (Physiology), Time, Intensity, Pitch discrimination, Auditory nerve, Auditory signals

Variations in the threshold of a 500-cps tone masked by random noise are studied as a function of simultaneous shifts in the interaural amplitude ratio and interaural time delay of the tone. The experimental results are found to coincide with the results of computations based on the equalization and cancellation model and are used to define a timeintensity trade for binaural unmasking. (Author)

AD-621 671 Div. 16/1 ,16/3
WASHINGTON UNIV ST LOUIS MO SCHOOL OF MEDICINE
QUANTITATIVE ANALYSIS OF REGENERATING AND DEGENERATING AREAS WITHIN THE LOBULE OF THE CARBON TETRACHLORIDE-INJURED LIVER,
by George R. Morrison, Frances E. Brock, Irene E. Karl, and Robert E. Shank. 26 Apr 65, 14p. Contract DA49 007MD1024 Grant ,PHS AM06309 02
Unclassified report

Pub. in Archives of Biochemistry and Biophysics v11 n2 p448-60 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Liver, Regeneration), (*Carbon tetrachloride, Liver), Wounds + injuries, Enzymes, Histological techniques, Microanalysis, Mitosis, Fats, Necrosis, Proteins, Hemoglobin, Lipids, Quantitative analysis

The livers of rats were studied 48 hours after acute carbon tetrachloride injury in order to determine the degree to which four areas of the lobule participate in both regenerative and degenerative processes and to relate alterations in enzyme activity in each area to these processes. Regenerative processes were shown to dominate the portal midzone area of the injured lobule while degenerative processes were localized largely in the central area. Within the degenerated central area, activities of alkaline phosphatase, phosphoglucoisomerase, and glucose6-phosphate dehydrogenase were elevated above control levels, while activities of lactic dehydrogenase, isocitric dehydrogenase, malic dehydrogenase, glutamic dehydrogenase, glutamic-alanine transaminase, and beta-hydroxybutyryl-CoA dehydrogenase were decreased. In the portal midzone, a decreased activity of phosphoglucoisomerase and an elevated activity of lactic dehydrogenase were the only alterations in ezyme activities which were interpreted as being related to the regenerative process when correlations were made between the introlobular patterns of enzyme activities and the introlobular patterns of the manifestations of regeneration and degeneration. (Author)

AD-621 690 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
BEFORE THE LEAP TO THE STARS.
Express rept. no. 6, on A1D Work Assignment no. 22,
by A. Golikov, and T. Kasyan. 24 Sep 62, 4p. Rept. no. ATD-62-154
TT , 65-64030
Unclassified report

Trans. of Ogonek (USSR) v40 n34 p4-5 1962.

Descriptors: (*Astronauts, USSR), Training, Weightlessness, Physiology, Food, Performance tests

A popularized account is presented of the USSR cosmonaut training program, with special attention to the problems of weightlessness.

AD-621 722 Div. 16/15,16/1
BROWN UNIV PROVIDENCE R I DEPT OF PSYCHOLOGY
COLOR SENSITIVE RESPONSES IN THE HUMAN FLICKER-ERG.
Technical rept.,
by Carl Richard Cavonius. 1957, 13p. Contract Nonr56221
Unclassified report

Pub. in Docum. Ophthal v18 p101-13 1957 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Color vision, Adaptation (Physiology)), Visual perception, Retina, Monochromatic light, Stimulation

Studies which have attempted to measure selective chromatic adaptation in the human ERG have demonstrated that although it is relatively simple to selectively depress either the photopic or the scotopic component, selective effects within the photopic system are very slight. The study to be described confirms these findings. The human photopic ERG was elicited by rapidly flickering monochromatic stimuli which were presented while the eye was exposed to steady monochromatic adapting fields. Computer averaging was employed to measure the resulting weak responses. Chromatic adaptation was found to depress responses to stimuli of all wavelengths about equally, although slight but reproducible selective effects occurred. These selective effects consisted of a greater depression in the amplitude of responses elicited by stimuli of wavelengths close to that of the adapting field. These selective effects were very small, and were equivalent to the decrease in response amplitude which could be produced by lowering stimulus intensity by a few hundredths of a long unit. Some of the implications of these findings are considered in terms of color theory. (Author)

AD-621 759 Div. 16/1
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
SPEED OF RECOVERY FROM CORIOLIS STIMULATION AND ITS RELATIONSHIP TO MOTION SICKNESS,
by Edwin W. Moore, and Robert L. Cramer. 1965, 2p.
Unclassified report

Pub. in Proceedings of the Annual Meetings of the American Psychological Association (73rd) p41-2 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Motion sickness, Coriolis effect), (*Coriolis effect, Stimulation), Stress (Physiology), Aviation medicine, Acceleration tolerance, Rotation, Semicircular canals, Oscillation

Tilting of the head in the frontal plane while rotating on a vertical axis imposes a bizarre accelerator stimulus on the superior and anterior semicircular canals. This stimulus is not characteristic of physiological terrestial motion but does simulate some conditions of powered flight. Responses to this stimulus include: (a) sensations of position and movement which are at variance with the real situation, (b) vertical nystagmus, and (c) occasional severe autonomic disturbances leading to emesis. All these responses persist beyond the stimulus, nystagmus being the most readily susceptible to objective and quantitative treatment. The temporal variations in the slow-phase velocity of the nystagmic response subsequent to stimulation of the canals can be described as a negative exponential decay function. It was the purpose of the investigation to determine the relationship between the rate of decay of the afternystagmus and motion sickness in flying personnel responding to relatively intense Coriolis stimulations.

AD-621 809 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C

BIOLOGICAL DATA ON THE NIKOLAEV AND POPOVICH FLIGHTS.
21 Sep 62, 6p. Rept. no. AID-62-147
TT , 65-64056

Unclassified report

Information in this report is taken from remarks made at a press conference held 21 August 1962 at Moscow State University.

Descriptors: (*Astronauts, Space flight), (*Space medicine, Astronauts), Weightlessness, Performance (Human), Space environmental conditions, Adaptation (Physiology), Acceleration tolerance, Life support, Telemeter systems, Medical examination, Atmosphere entry, Training, Space communication systems, USSR

AD-621 810 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
BIOLOGICAL DATA ON THE NIKOLAEV AND POPOVICH FLIGHTS.
13 Sep 62, 2p. Rept. no. AID-62-138
TT , 65-64055

Unclassified report

Descriptors: (*Astronauts, Space flight), (*Space medicine, Astronauts), Performance (Human), Weightlessness, Respiration, Electrocardiography, Adaptation (Physiology), Sensory perception, Telemeter systems, Medical examination, Physiology, USSR

AD-621 811 Div. 16/1 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
PRELIMINARY BIOLOGICAL DATA (VOSTOK-3).
6 Sep 62, 6p. Rept. no. AID-62-133
TT , 65-64054

Unclassified report

Review trans. of Pravda, Moscow (USSR) 12-16 Aug 1962.

Descriptors: (*Astronauts, USSR), (*Space medicine, Astronauts), Space flight, Performance (Human), Medical examination, Physical fitness

Vostok-3 had completed more than 64 orbits around the Earth in 95 hours, and Vostok-4 completed more than 48 orbits in 71 hours. The two spaceships flew close to each other for almost 3 days and maintained direct and regular contact with each other. Launching and landing operations were carried out in strict accordance with the specified plans. All the onboard systems and instruments functioned perfectly during the entire flight. Objective medical data indicated that Nikolayev and Popovich withstood the launch period, orbital flight, and landing period with no adverse effects; both cosmonauts were in excellent physical condition during the flight, they were cheerful, felt well, and retained full work capacity. They carried out a large program of flight activities. Their postflight physical condition was good. The two cosmonauts coordinated their activities, exchanged information on their situations and on the functioning of onboard equipment, and compared the results of their observations. (Author)

AD-621 813 Div. 16/1 ,16/3
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
EFFECT OF THE AUTORADIOLYSIS ON THE RENAL CLEARANCE VALUES OF 131-I LABELLED HYPAQUE AND HIPPURAN,
by U. Rosa, S. Sosi, C. Bianchi, and E. Meozzi.
1965, 13p. Rept. no. SORIN-58

Unclassified report

Prepared for presentation at International Symposium on the Preparation and Biomedical Applications of Labelled Molecules, Venezia, 24-29 Aug 1964 (Copies available only to DDC users). Prepared in cooperation with Pisa Univ. (Italy). Nuclear Medicine Center and CEA, Saclay (France). Radioscopes Dept.

Descriptors: (*Kidneys, Tracer studies), (*Labelled substances, Decomposition), Iodine compounds, Radiochemistry, Stabilization, Organic nitrogen compounds, Benzoates, Italy

It is shown that free iodine in a concentration of 3-5% in 1131 labelled Hypaque (diatrizoate) and Hippuran can cause a comparatively large error when these radiopaque substances are used in renal clearance studies. The free iodine is largely a result of autoradiolysis, a problem which may be alleviated by using I125 labelled solutions.

AD-621 834 Div. 16/1 ,16/12
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
THE SPINOCERVICAL TRACT: DORSAL COLUMN LINKAGE, CONDUCTION VELOCITY, PRIMARY AFFERENT SPECTRUM,
by Arthur Taub, and Peter O. Bishop. 25 Mar 65, 21p. Contract DA36 039AMC03200E ,AF33 615 1747

Unclassified report

Pub. in Experimental Neurology v13 n1 p1-21 Sep 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Spinal cord, Sensory perception), (*Sensory perception, Spinal cord), Spinal column, Brain, Central nervous system, Touch, Skin, Nerve cells, Nerve fibers, Nerve impulses, Nervous system, Physiology, Proprioception, Pain, Thresholds (Physiology), Reflexes

Microelectrode studies of single units in the spinocervical tract of the cat under barbiturate anesthesia demonstrate a monosynaptic linkage between the spinocervical tract and dorsal column cutaneous afferents at the segmental level of dorsal root entry. The spinocervical tract is substantially independent of the dorsal spinocerebellar tract, at least 75% of units studied terminating in the region of the ipsilateral lateral cervical nucleus. Mean over-all conduction velocity of units in the spinocervical tract is 58.0 m/sec, compared with mean over-all conduction velocity of cutaneous afferents in the dorsal columns providing input to these spinocervical tract units of 38.6 m/sec. The dorsal column input contains the Aalpha cutaneous component, of which the small-fibered half is most effective in exciting spinocervical tract units. The Adelta component is lacking. The spinocervical tract primary afferent input contains at least all of the A group to the Adelta component. Thus slow-conducting cutaneous primary afferent fibers may project to fast-conducting long pathways. Some functional and clinical aspects of the spinocervical tract and its homologue are discussed. (Author)

AD-621 848 Div. 16/1 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
MARYLAND UNIV COLLEGE PARK INST FOR FLUID DYNAMICS AND APPLIED MATHEMATICS
NONMONOTONICITY OF SOLUTIONS OF LINEAR DIFFERENTIAL EQUATIONS OCCURRING IN THE THEORY OF URINE FORMATION.
Technical note,
by Robert B. Kelman, Donald J. Marsh, and Henry C. Howard. Aug 65, 36p. Rept. no. TN-BN-413
Contract Nonr59517 Grant ,N1H AM06864 03

Unclassified report

Descriptors: (*Physiology, Mathematical models), (*Urinary system, Mathematical analysis), (*Differential equations, Biology), Matrix algebra, Boundary value problems, Blood vessels, Physiology, Kidneys

A model is given for the renal medulla which leads to a functional boundary value problem for a fourth order system of linear differential equations c prime = G c, where G is a piecewise constant 4 X 4 matrix and the components of c represent solute concentrations in uriniferous tubules and in blood vessels. c1 and c3 are specified at x = o, and c = P c at x = lambda (lambda is the length of the medulla) where P is a permutation matrix whose main diagonal is zero. Solutions are sought that are continuous and piecewise differentiable. Existence uniqueness, and positiveness of c are shown. Certain arithmatic averages of the components of c correspond to the interstitial solute concentration. Under the assumption that active solute transport is limited to that part of the model corresponding to the outer medulla, which leads to certain restrictions on the matrix G, it is shown that the interstitial concentration is nonmonotonic and achieves its maximum value in the outer medulla - a result of interest in the theory of urine formation. (Author)

AD-621 898 Div. 16/1 ,16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A STUDY OF THE PHYSIOLOGICAL CHANGES WHICH OCCUR DURING ACCLIMATION TO HIGH ALTITUDE. THE CHANGES IN HEART SIZE IN MAN DURING PARTIAL ACCLIMATIZATION TO SIMULATED HIGH ALTITUDES.
Research rept.,
by Ashton Graybiel, John L. Patterson Jr., and Charles Houston. 28 Jan 48, 22p. Rept. no. 6, NSAM-87
Proj. NM001 059 03 X720 Av376s

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Acclimatization, High altitude), (*High altitude, Acclimatization), (*Anoxia, Heart), Decompression, X rays, Barometric pressure, Oxygen consumption, Stress (Physiology), Aviation medicine, Pressure breathing

Four healthy young men were partially acclimatized over a period of one month to simulated high altitudes in a decompression chamber. During the fourth week the subjects were able to remain at 22,500 feet and on occasions were taken to higher altitudes for short periods. The size of the heart shadow, as revealed in teleroentgenograms, was determined at frequest intervals. Measurements of the films of one subject were not made because the right border of the heart was obscured by the shadow of the spine. The results indicate that the heart shadow decreased slightly in size when the subjects were exposed to reduced atmospheric pressures. There is no reason to doubt but that this decrease in heart shadow size indicated an actual rather than an apparent decrease in heart size. Although our data do not directly bear on the cause of the decrease in heart size, it is believed to be due to decreased cardiac filling or smaller stroke volume or both. It is concluded that during an early stage of acclimatization to severe anoxia under the conditions of our experiment dilatation of the heart does not occur but, rather, the heart may decrease slightly in size. Some of the literature relating to the effect of anoxia on heart size is reviewed. (Author)

AD-621 900 Div. 16/1 ,16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

COMPOSITION OF ALVEOLAR AIR AND RATE OF PULMONARY VENTILATION DURING LONG EXPOSURE TO HIGH ALTITUDE.
Research rept.,
by Richard L. Riley, and Charles S. Houston. 8 Sep 48, 12p. Rept. no. 7 ,NSAM-88
Proj. NM001 013 X720 Av376s

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Acclimatization, High altitude), (*High altitude, Acclimatization), (*Respiration, High altitude), Hypoxia, Anoxia, Pressure breathing, Oxygen consumption, Blood analysis, Carbon dioxide, Oxygen, Barometric pressure, Aviation medicine

Alveolar gas pressures and resting pulmonary ventilation were repeatedly measured as four subjects were continuously exposed to increasing altitude in a low pressure chamber during a thirty-five day period. Average alveolar carbon dioxide and oxygen pressures correspond closely with the data of other observers up to 18,000 feet. Above this point the alveolar (sub p) CO2 values of our subjects were lower. Alveolar (sub p) O2 values were also slightly lower than those reported by Helmholz et al. The respiratory quotients of our partially acclimatized subjects were lower than those of the subjects of short term exposures. The values reported herein are probably more representative of the equilibrium state at any given altitude. In terms of ambient conditions, pulmonary ventilation was found to increase with increasing altitude. In terms of standard conditions, however, ventilation remained nearly constant at the altitudes studied. This indicates that roughly the same number of molecules of oxygen were taken into the lungs during inspiration at altitude as at sea level. (Author)

AD-621 902 Div. 16/1
MEDICAL COLL OF VIRGINIA RICHMOND DEPT OF PSYCHIATRY
SALIVARY RESPONSE TO STIMULATION OF GASTRIC BRANCHES OF VAGUS NERVE,
by Charles H. Hockman, Earl C. Hagstrom, and Ebbe C. Hoff. 5 Jan 65, 4p. Contract Nonr113403 Grant ,PHS NB01024 Proj. NR105 228

Unclassified report

Pub. in The American Journal of Physiology v209 n1 p119-21 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Saliva, Secretion), (*Nervous system, Saliva), (*Salivary glands, Reflexes), Nerves, Autonomic nervous system, Peripheral nervous system, Cerebrum, Stomach, Cranial nerves, Stimulation, Cats

In adult cats anesthetized with ether and immobilized with Flaxedil, submaxillary salivation was elicitied following electrical stimulation of the central cut ends of the dorsal and ventral gastric branches of the vagus nerve. This response was abolished when the lingual nerve was severed above the terminal branching of the chorda tympani. Ipsilateral or contralateral section of the vagus nerve in the neck had no effect on the salivary response; however, it disappeared completely when the vagi were cut bilaterally. This shows that the visceral afferents mediating this response, from either gastric branch of the vagus, travel centrally in both vagi. These studies demonstrate a feedback circuit from the stomach to the salivary glands. (Author)

AD-621 905 Div. 16/1 ,16/12
PISA UNIV (ITALY) ISTITUTO DI FARMACOLOGIA
MODIFICATION OF THE PRIMARY EVOKED RESPONSE OF THE VISUAL AREA IN THE MONKEY DURING CONDITIONED BEHAVIOR. (MODIFICAZIONI DELLE RISPOSTE PRIMARIE EVOCATE NELL'AREA VISIVA DELLA SCIMMIA DURANTE IL COMPORTAMENTO CONDIZIONATO),
by G. F. Ricci, F. Valassi, and L. Zamparo. Mar 63, 4p. Contract AF EOAR62 102
AFOSR , J-837

Unclassified report

Pub. in Dal Bollettino Della Societa Italiana Di Biologia Sperimentale v39 n10 p594-7 1963 (Copies available only to DDC users). Text in Italian.

Descriptors: (*Vision, Cerebral cortex), (*Cerebral cortex, Vision), Conditioned reflex, Behavior, Stimulation, Inhibition, Nervous system, Physiology, Monkeys, Italy

AD-621 918 Div. 16/1
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
INVESTIGATION OF THE DISTRIBUTION IN AND THE REMOVAL FROM THE PERITONEAL CAVITY OF RADIOCOLLOIDS HAVING DIFFERENT CHEMICOPHYSICAL PROPERTIES. (STUDIO DELLA RIPARTIZIONE IN CAVITA PERITONEALE E DELLA MIGRAZIONE DALLA STRESSA DI RADIOCOLLOIDI CON CARATTERISTICHE FISICHE E CHIMICO FISICHE DIVERSE),
by B. Bellion, S. Sosi, G. Buchi, and S. Chiarle. 1964, 12p. Rept. no. SORIN-52

Unclassified report

Pub. in Minerva Nucleare v8 n5 p285-9 Sep-Oct 1964 (Copies available only to DDC users), Prepared in cooperation with Torino Univ. (Italy). Text in Italian.

Descriptors: (*Labelled substances, Colloids), (*Colloids, Injection (Medicnine)), Rabbits, Peritoneum, Distribution, Particle size, Physical properties, Chemical properties, Blood, Italy

B. Bellion, G. Buchi, S. Chiarle and S. Sosi: Investigation of the distribution in and the removal from the periotneal cavity of radiocolloids having different chemicophysical properties. The biological behaviour of different types of radiocolloids injected into the peritoneal cavity of healthy rabbits was investigated. The distribution of the colloids in the peritoneal cavity depends on the diameter of the particles, as does the proportion which passes into the blood stream. The chemico-physical properties of radiocolloids have a determining role in their migration, expecially of the size of the particles is identical. (Author)

AD-621 957 Div. 16/15
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
SOME RELATIONSHIPS BETWEEN THE AVERAGE ENERGY OF THE QUANTA IN A VISUAL STIMULUS AND THE COLOR RESPONSE,
by Rainer Roehler. Sep 65, 28p. Rept. no. P-3230
TT , 65-64087

Unclassified report

Einige Zusammenhaenge Zwischen der Mettleren Groesse der Quanten in Einem Lichtreiz und der Farbempfindung. Trans. of Vision Research (U. S.) v5 p361-77 1965.

Descriptors: (*Color vision, Adaptation (Physiology), (*Photons, Energy), Visual acuity, Colors, Brightness, Absorption, Retina, Germany

It is shown that the ratio of the number of light quanta absorbed by the retina to the absorbed light energy is an important parameter in the elaboration of color information by the visual sense. For this ratio, thus the number of quanta absorbed per unit of absorbed energy, we have introduced the term 'specific quantum number' (SQN). By measuring the SQN for various spectral regions it is shown, on the basis of Grassmann's laws, that all light stimuli which occupy the same in color space, independently of their color composition (metamers), also have equal SQN's. The color loci, for equal SQN in the color triangle, lie along lines which coincide exactly with the tritanopic color confusion lines. One component of the color discriminating function of the visual sense derives from the ability to gauge differences in the specific quantum number. With the help of a simple model, the dependency of opponent-color experience upon receptor excitation is qualitatively described. (Author)

AD-621 983 Div. 16/10
YALE UNIV NEW HAVEN CONN SCHOOL OF MEDICINE
A FATAL HEMOLYTIC TRANSFUSION REACTION WITH ACUTE AUTOHEMOLYSIS,
by H. F. Polesky, and J. R. Bove. 1963, 4p. Contract DA49 193MD2163

Unclassified report

Pub. in Proc. 9th Congr. Int. Soc. Blood Transf., Mexico 1962 p751-4 1964 (Copies available only to DDC users.)

Descriptors: (*Blood transfusions, Hemolysis), Antigens + antibodies, Antigen-antibody reactions, Agglutininis, Blood analysis, Medical examination, Immunity, Immune serums, Leukemia, Pathology, Radioactive isotopes, Labeled substances

AD-621 984 Div. 16/1
YALE UNIV NEW HAVEN CONN SCHOOL OF MEDICINE
THE EMERSON CUP TEST IN BLOOD BANK PRACTICE,
by J. R. Bove. 1962, 5p. Contract DA49 193MD2163

Unclassified report

Pub. in Proc. Congr. int. Soc. Blood Transf. (9th) p588-92 1964 (Copies available only to DDC users).

Descriptors: (*Blood groups, Test methods), (*Blood transfusions, Test methods), (*ABO incompatibility, Test methods), Antigen - Antibody reactions, Immune serums, Erythrocytes, Medical laboratories, Laboratory equipment

AD-621 985 Div. 16/10
YALE UNIV NEW HAVEN CONN SCHOOL OF MEDICINE
THE ANTIGLOBULIN REACTION ON ALBUMIN ENRICHED CELL SUSPENSIONS,
by Edwin M. Clayton, Richard B. Brown, and Joseph R. Bove. 25 Sep 64, 6p. Contract DA49 193MD2163 Grant ,PHT 5T1 GM696

Unclassified report

Pub. in Transfusion v5 n4 p344-9 Jul-Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Immunology, Rh incompatibility), (*Rh incompatibility, Test methods), (*Antigenantibody reactions, Rh incompatibility), (*Serum albumin, Rh incompatibility), Globulin, Immune serums, Blood groups, Erythrocytes, Blood transfusions

The strength of the antiglobulin reaction with cells incubated in saline was compared with a similar reaction when albumin was added before or after incubation. In one case studied a weak rh double prime (E) antibody was not detected by the antiglobulin test with saline suspended cells and a transfusion reaction occurred. The incompatibility could

be found by the antiglobulin test if the incubation mixture included added albumin. In another case an unidentified antibody had consistently weaker antiglobulin reactions after incubation in albumin compared to saline. An investigation of the antiglobulin activity of 40 antibodies showed antiglobulin agglutination scores that were significantly greater after incubation in the presence of albumin rather than saline. These data suggest that the sensitivity of the antiglobulin test is usually increased when antibodies and erythrocytes are incubated with added albumin. (Author)

AD-621 986 Div. 16/10
YALE UNIV NEW HAVEN CONN SCHOOL OF MEDICINE
A FATAL HEMOLYTIC TRANSFUSION REACTION WITH ACUTE AUTOHEMOLYSIS.
Revised ed.,
by Herbert F. Polesky, and Joseph R. Bove. 14 Feb 64, 8p. Contract DA49 193MD2163 Grant, PHS5T1GM696 03
Unclassified report

Pub. in Transfusion v4 n4 p285-92 Jul/Aug 1964 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 2 Nov 63.

Descriptors: (*Blood transfusions, Hemolysis), Antigens + antibodies, Antigen - antibody reactions, Agglutinins, Medical examination, Blood analysis, Immunity, Leukemia, Immune serums, Pathology, Radioactive isotopes, Labeled substances

A fatal hemolytic transfusion reaction due to anti-Kidd (Jk (a)) is described in a woman with aplastic anemia associated with acute leukemia. Radioactive chromium studies, which were in progress at the time, made it possible to demonstrate that a severe autohemolytic crisis was a part of the reaction. The relationship between a hemolytic transfusion reactionand the initiation or intensification of autohemolysis is discussed. The difficulties of serologic diagnosis and selection of blood for transfusion in patients with nonspecific antibodies are reviewed. This case again illustrates that nonspecific agglutinins can mask the presence of specific anti-red cell antibodies. (Author)

AD-622 026 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT.
Final technical rept. for Jan-Apr 64,
by John H. Henzel, Neville P. Clarke, George C. Mohr, and Edund B. Weis,Jr.. Aug 65, 15p.
Rept. no. amrl-TR-65-134
Proj. 7231 Task 723106
Unclassified report

Descriptors: (*Ejection, Fractures (Bone)), (*Fractures (Bone), Spinal column), (*Spinal column, Acceleration tolerance), Thorax, Acceleration, Ejection seats, Impact shock, Tolerances (Physiology), Wounds + injuries, Space medicine, Stress (Physiology)

The occurrence of compression deformities of the fourth and fifth thoracic vertebrae in a human test subject (DCL) exposed in laboratory experiments to an impact acceleration profile similar to that produced by ejection seat rockets is reported. This injury was presumed to be the result of an impact profile having a peak acceleration of 18.8G, a rate of onset of 420G per second and a baseline duration of approximately 100 milliseconds. The subject's long axis was inclined backward 34 degrees from the vertical force vector. The diagnosis was established upon the subject's termination of hazardous duty and separation from the service, approximately one year after the presumptive data of injury. This documented injury represents a demonstrable endpoint in impact tolerance of a subject exposed to an acceleration enivornment which can be specifically described. (Author)

AD-622 047 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
TEST AND EVALUATION OF U. S. AIR FORCE EXPERIMENTAL CUTAWAY TYPE ANTI-BLACKOUT SUITS DESIGNATED MA-1.
Special rept.,
by J. J. Zarriello, and Mary E. Norsworthy. 30 Apr 59, 14p. Rept. no. SR-59-4
Unclassified report

Descriptors: (*Blackout (Physiology), Pressure suits), (*Pressure suits, Tests), Protective clothing, Acceleration tolerance, Pilots, Naval personnel, Aviation medicine, Tables

The purpose of this study was to test and evaluate the U. S. Air Force experimental cutaway type anti-blackout suit designated MA-1. The MA-1 anti-blackout suit was tested and evaluated for anti-blackout protection at various positive G levels to the points of greyout and blackout. The results of the anti-blackout protection afforded by the anti-blackout suit has been presented in table form. The suit is comfortable, provides adequate anti-blackout protection, and would probably be well accepted by fleet pilots. No major differences were noted between the protection afforded by the MA-1 anti-blackout suit between experienced and inexperienced subjects. (Author)

AD-622 055 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EFFECT OF PREOXYGENATION ON RESISTANCE TO AEROEMBOLISM: PREOXYGENATION IN SUSCEPTIBLE INDIVIDUALS,
by H. R. Biorman, and J. F. Lally. 16 Feb 43, 4p. Rept. no. NSAM-60
Unclassified report

Descriptors: (*Aviation medicine, Decompression sickness), (*Decompression sickness, Aviation medicine), High altitude, Flight, Barometric pressure, Oxygen consumption, Stress (Physiology), Adaptation (Physiology)

Twenty-five subjects, who failed during an exposure to 35,000 feet for 40 minutes and 40,000 feet for 10 minutes were retested at these same altitudes. Fifteen of the 25 failed again to complete the test, and 10 completed the test without incapacitating symptoms. Following one hour of preoxygenation at sea level and at rest, all 25 were exposed to 35,000 feet for 4 hours. Only 3 were unable to complete the 4 hours without incapacitating symptoms of decompression illness. Following one hour of preoxygenation at rest at sea level, 88 percent of susceptible individuals were protected from incapacitating symptoms of decompression illness at 35,000 feet for 4 hours. Conclusions: Denitrogenation for 60 minutes at rest at sea level protected for at least 4 hours at a pressure altitude of 35,000 feet 88 percent of individuals who were proven susceptible to the effects of low barometric pressure. (Author)

AD-622 141 Div. 16/1 ,16/3
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DEPT OF IMMUNOCHEMISTRY
INHIBITION OF THE THIRD COMPONENT OF THE COMPLEMENT SYSTEM BY DERIVATIVES AROMATIC AMINO ACIDS,
by Ross S. Basch. 27 Jul 64, 13p.
Unclassified report

Pub. in The Journal of Immunology v94 n4 p629-40 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Immunology, Complement), (*Complement, Inhibition), (*Amino acids, Complement), Aromatic compounds, Reaction kinetics, Antigen-antibody reactions, Erythrocytes, Hemolysis, Enzymes

The data presented show that a group of aromatic amino acid derivatives react with the component responsible for immune adherence and also inhibit the formation of the thermostable intermediate found during the action of whole C'3. The report does not unequivocally demonstrate the presence of an enzymatic step in the production of these cells, nor does it delineate the mechanism of the reaction. It does suggest that an enzymatic step exists; it further suggests what components are involved and where further study would seem most profitable.

AD-622 143 Div. 16/1
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
THE MICROSCOPIC DETERMINATION OF AGE IN HUMAN BONE,
by Ellis R. Kerley. 1965, 15p.
Unclassified report

Pub. in American Journal of Physical Anthropology v23 n2 p149-63 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Bone, Aging (Physiology)), (*Aging (Physiology), Bone), Skeleton, Humans, Visual inspection, Anthropology, Archaeology, Life cycle, Histology, Diseases, Sex, Pathology, Correlation techniques

The microscopic age changes that occur in human cortical bone were measured by counting the number of osteones, osteon fragments and non-Haversian canals, and estimating the percentage of lamellar bone in four selected 100 power fields in the outer third of the cortex in ground sections from the mid-shaft of the femur, tibia and fibula. Age graphs were derived from 126 specimens covering the age range from birth through 95 years. The best correlation with age by regression analysis was found in the osteon fragment number in the fibula (rho = 9.74). The use of the regression formula for this factor permits the age to be estimated within = ten years of the actual age 95% of the time. An alternative method utilizes a specially devised profile chart to estimate age from the age change graphs. When this method was checked on 56 additional specimens, 87.3% of the estimates were within = five years of the actual age, and all estimates were within = ten years. It was concluded that there are measurable microscopic age changes in the cortex of the major long bones of the leg that can be used to estimate the age of an individual with known accuracy over the entire range from birth to 95 years. This method can be applied to fragmented and incomplete skeltons as well as eroded archeologic skeletons, since only the mid-shafts of leg bones are used. (Author)

AD-622 144 Div. 16/10
GEORGETOWN UNIV WASHINGTON DC
MYELIN ARTIFACTS IN THE OPTIC DISC AND RETINA,
by Lorenz E. Zimmerman, and Ben S. Fine. 2 Apr 65, 5p. Contract DA49 193MD2680 Grant ,PHS NB5379 03S1
Unclassified report

Pub. in Archives of Ophthalmology v74 p394-8 Sep 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Eye, Pathology), Optic nerve, Nerve fibers, Retina, Tissues (Biology), Electron microscopy, Ophthalmology

Artifactitious deposits of fragmented myelinated nerve fibers are observed in the optic nerve head, in the juxtapapillary retina and choroid, beneath the retina, in the vitreous, and in the retinal blood vessels. These are the result of excessive trauma to the nerve close to the globe during enucleation, with the expression of myelin from the nerve into the affected ocular tissues. Proof that the material in question consists of fragments of myelinated nerve fibers has been obtained by electron microscopy. Familiarity with the various forms that such accumulations may take is of practical importance to the ophthalmic pathologist lest he misinterpret the 'lesion' as tumor, papilledema, retinal detachments, vascular disease, etc. (Author)

AD-622 148 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
PROGNOSIS OF MUCINOUS (GELATINOUS) CARCINOMA OF THE BREAST,
by Henry J. Norris, and Herbert B. Taylor. 15 Jan 66, 7p.

Unclassified report

Pub. in Cancer v18 n7 p879-85 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cancer, Mammary glands), Mucin, Morphology (Biology), Cells (Biology), Lymphatic system, Histology, Visual examination, Histological techniques, Surgery, Pathology

One hundred two examples of mucinous carcinoma of the breast were divided into two histologic groups: 62 pure mucinous carcinomas, in which no areas of infiltrating duct carcinoma were present, and 40 mixed mucinous carcinomas, in which areas of infiltrating duct carcinoma were present. Of the patients with mixed mucinous carcinoma 42% had recurrence or metastasis after surgery, compared with 10% of those with pure mucinous carcinoma. Significantly fewer patients died with carcinoma in the pure mucinous group than in the mixed group (P less than 0.01). Of the patients with pure mucinous carcinoma who died with cancer, 2 had carcinomas in the opposite breast and 3 others had insufficient for thorough evaluation of the primary tumor to exclude the presence of infiltrating duct carcinoma. Axillary metastasis occurred in only 2 patients in the pure mucinous group, which was significantly less often than in the mixed mucinous group (P less than 0.001). Because of the rarity of axillary metastasis in patients with pure mucinous carcinoma, simple mastectomy is considered adequate therapy. Radical mastectomy is recommended for patients having mucinous carcinoma with areas of infiltrating duct carcinoma. (Author)

AD-622 153 Div. 16/1 ,16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A STUDY OF THE PHYSIOLOGICAL CHANGES WHICH OCCUR DURING ACCLIMATIZATION TO HIGH ALTITUDE. AN ACTIVE FORM OF HEMOGLOBIN FORMED DURING ACCLIMATIZATION.
Research rept.,
by R. L. Riley, C. S. Houston, W. H. Jarvis,Jr., and Ashton Graybiel. 31 Sep 46, 10p. Rept. no. 5 ,86
Proj. NM001 059 03 X720 Av376s

Unclassified report

Descriptors: (*Acclimatization, High altitude), (*High altitude, Acclimatization), (*Hemoglobin, Anoxia), Organic pigments, Oxygen consumption, Blood chemistry, Blood, Glucose, Lactic acid, pH, Ascorbic acid, Diet, Colorimetric analysis, Aviation medicine

A form of hemoglobin which apparently is not active in the transport of oxygen has been found in the blood of four men acclimatizing to high altitude. This pigment resembles other inactive pigments previously described by Barkan, Ammundsen, Roughton and others. In amount the pigment varied from 0.5 to 3.0 vols. percent during rest and was always less during exercise, as compared to the average value of 0.45 vols. percent found in seventeen determinations on eight individuals at sea level and during short periods of anoxia. No consistent relationship was found between the amount of pigment and blood lactic acid, sugar, pHs, or the degree of anoxia present. In the acclimatizing subjects there was no consistent relationship of inactive pigment to ascorbic acid intake, but three normal subjects demonstrated an increase in inactive pigment during and for a short time after a few days of elimination of ascorbic acid from their diets. The inactive pigment is very labile, being readily activated by short periods of moderate exercise, and does not appear to be methemoglobin as determined by a simplified photoelectric colorimeter. (Author)

AD-622 154 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
EMORY UNIV ATLANTA GA
THE CEREBRAL CIRCULATION AND METABOLISM IN CHRONIC PULMONARY EMPHYSEMA WITH OBSERVATIONS ON THE EFFECTS OF INHALATION OF OXYGEN.
Joint research rept.,
by John L. Patterson,Jr., Albert Heyman, and T. Whatley Duke. 26 Jul 51, 13p. Contract N9onr92500 Proj. NR112 607,NM001 050 01 02
NSAM , 712

Unclassified report

Descriptors: (*Oxygen consumption, Respiratory diseases), (*Brain, Respiratory diseases), (*Respiratory diseases, Blood circulation), Metabolism, Cerebral cortex, Respiration, Blood vessels, Carbon dioxide

The cerebral blood flow (CBF), oxygen consumption (CMRO2) and vascular resistance (CVR) were determined by the nitrous oxide technique before and during the administration of 85-100% oxygen in nine patients with chronic pulmonary emphysema and in eight control subjects. In the patients with emphysema the mean CBF was significantly elevated, while the mean CMRO2 was slightly below control values. There was a tendency for the emphysematous patients with the lowest arterial pO2 and the highest pCO2 values to show the highest blood flow values. The converse was also true. Inhalation of 85-100% oxygen was generally followed by an increase in CBF in the patients with emphysema in contrast to the control patients in whom the CBF decreased. Two emphysematous patients who had the lowest CBF values while breathing air showed a decrease in CBF during inhalation of oxygen. The mean CMRO2 did not change in either group of patients with oxygen administration. One patient with emphysema exhibited mental aberrations which may have been aggravated by oxygen therapy. Oxygen caused an increase in spinal fluid pressures in the patients with emphysema and either no change or a fall in spinal fluid pressures in the control subjects. (Author)

AD-622 158 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
REVIEW OF EXISTING DATA ON THE INCIDENCE OF DECOMPRESSION ILLNESS IN PERSONNEL AT AND BELOW 30,000 FEET.
Research rept.,
by H. A. Smedal. 7 Sep 48, 10p. Rept. no. 3 ,92
Proj. NM001 017 X762 Av390k ,NM001 05 05 03

Unclassified report

Descriptors: (*Aviation medicine, Decompression sickness), (*Decompression sickness, Aviation personnel), (*High altitude, Decompression sickness), Pilots, Flight, Pressurized cabins, Stress (Physiology)

Pressurization of aircraft cockpits and cabins to a pressure altitude of 30,000 feet will result in the production of symptoms of decompression illness. The severity of the symptoms and hence the probability of incapacitation will be directly proportional to the amount of physical activity carried out by the individual occupying such a cabin or cockpit. Pressurization of aircraft cockpits and cabins to altitudes below 30,000 feet will progressively lower the incidence and severity of symptoms of decompression illness. It is unlikely that very severe symptoms will be encountered at altitudes below 23,000 feet in military aviation.

AD-622 159 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EFFECTS OF REPEATED DECOMPRESSION OF 25 SUBJECTS TO A SIMULATED ALTITUDE OF 20,000 FEET DURING APPROXIMATELY ONE MONTH,
by H. A. Smedal. 26 Jan 48, 6p. Rept. no. 2 ,91
Proj. X762 Av390k

Unclassified report

Descriptors: (*Aviation medicine, Decompression sickness), (*Decompression sickness, Aviation personnel), (*High altitude, Decompression sickness), Decompression, Simulation, Tolerances (Physiology), Stress (Physiology)

The repeated frequent decompression of healthy male subjects between the ages of 18 - 25 years for an extended period of time results in the production of no serious symptoms of decompression when the exposures are confined to a pressure altitude of 20,000 feet. There is no deterioration in the individual's ability to tolerate such decompressions. Since so few symptoms occurred, no adaptation was demonstrated. (Author)

AD-622 160 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
TULANE UNIV NEW ORLEANS LA
THE INFLUENCE OF VISUAL ORIENTATION ON APPARENT BODILY ROTATION FOLLOWING ACTUAL ROTATION.
Research rept.,
by F. E. Guedry,Jr., J. T. Ray, and J. I. Niven. 14 Jan 52, 7p. Rept. no. joint project rept. no. 23 Contract N7onr43401 Proj. NR143 455 ,NM001 063 01 23
NAVMED , NM-001-063.01.23

Unclassified report

Descriptors: (*Rotation, Afterimages), (*Afterimages, Rotation), (*Vision, Afterimages), Illusions, Posture, Acceleration, Deceleration, Adaptation (Physiology), Illumination, Sensory perception, Body, Eye, Vestibular apparatus

Feelings of apparent bodily rotation are very similar in their general characteristics to the oculogyral illusion. This 'postural component' can be reported independently of the visual illusion. Three experienced observers were required to report it under two conditions of rotary acceleration and deceleration, identical except that in one there was interpolated a 5 sec. period of general room illumination following deceleration. All observers reported the first effect and the beginning of the second effect in the totally dark condition, but feelings of apparent bodily rotation were inhibited by the visual orientation afforded during illumination of the room. Duration of the first effect was significantly reduced for all observers; time to the beginning of the second effect was reduced for two observers, while the second effect was completely abolished for the third. (Author)

AD-622 161 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
TULANE UNIV NEW ORLEANS LA
THE DELAY IN VISUAL REORIENTATION

FOLLOWING EXPOSURE TO A CHANGE IN DIRECTION OF RESULTANT FORCE ON A HUMAN CENTRIFUGE.
Rept. no. 1,
by Ashton Graybiel, and Robert H. Brown. 1965, 13p. Rept. no. joint project rept. no. 3
Contract N7onr43401 Proj. NR140 455 ,NM001 037
NAVMED , NM-001-037
Unclassified report

Descriptors: (*Rotation, Vision), (*Vision, Rotation), Aviation medicine, Ear, Eye, Humans, Centrifuges, Proprioception, Acceleration, Deceleration, Posture

Three subjects were exposed on a human centrifuge to a change in direction of resultant G relative to the body axis. Under the conditions of the experiment the illusion was created wherein a horizontal target line appeared to rotate through an angle corresponding to the change in direction of the resultant force. The subject's task was to keep the line horizontal at all times. Thus, if the line appeared to rotate clockwise, the subject actually rotated the line counterclockwise in order to maintain the line horizontal for himself. A marked discrepancy was noted between the time required to impress the physical force on the subject and the period during which he found it necessary to make adjustments in keeping the line horizontal. This discrepancy was regarded as a measure of the delay in the subject's visual reorientation to a change in direction of resultant G. It is thought that a possible cause of the delay may lie in the characteristic behavior of the otolith organ. This lag phenomenon is of importance to aviation inasmuch as the full disorientating effects of a change in direction of resultant G relative to the body axis will not become manifest if the exposure time is short. (Author)

AD-622 163 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EFFECTS OF DECOMPRESSION ON THIRTY-FIVE SUBJECTS REPEATEDLY EXPOSED TO A SIMULATED ALTITUDE OF 20,000 FEET DURING APPROXIMATELY ONE MONTH.
Research rept.,
by H. A. Smedal, and Ashton Graybiel. 1 Sep 47, 22p. Rept. no. 1 90
Proj. X762Av390k ,NM001 059.05.01
Unclassified report

Descriptors: (*Aviation medicine, Decompression sickness), (*Decompression sickness, Aviation personnel), (*High altitude, Decompression sickness), Oxygen consumption, Pressure breathing, Adaptation (Physiology), Stress (Physiology), Pressurized cabins, Etiology, Simulation

When healthy young subjects breathing supplementary oxygen were exposed to a pressure altitude of 20,000 feet for 30 minutes both morning and afternoon over a period of a month it was found that: (a) with rare exceptions there were no severe symptoms of decompression; (b) symptoms requiring recompression of the subject may occur if additional etiologic factors are present; (c) the most important symptom was fatigue but the exact role of decompression in its causation still remains to be evaluated; (d) the repeated exposures did not lead to an increase in severity of symptoms; (e) if the incidence of symptoms is allowed as a measure of susceptibility our data suggests that, after a temporary increase in susceptibility, there is a sharp fall to well below the initial level suggesting that adaptation to mild decompression occurs.

AD-622 164 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A STUDY OF THE PHYSIOLOGICAL CHANGES WHICH OCCUR DURING ACCLIMATIZATION TO HIGH ALTITUDE. OCCURRENCE OF AEROEMBOLISM AT MODERATE ALTITUDES,
Research rept.,
by C. S. Houston. 4 Sep 46, 8p. Rept. no. RR-2
Proj. X-720 (Av-376-s)
Unclassified report

Descriptors: (*Acclimatization, High altitude), (*Aviation medicine, Decompression sickness), (*Decompression sickness, Aviation personnel), (*High altitude, Decompression sickness), Stress (Physiology), Adaptation (Physiology), Pilots, Pain

In the course of a thirty day study of acclimatization to increasing altitude in a low pressure chamber, twenty individuals made three hundred and eighty-seven lock ascents to altitudes ranging from 2,000 to 22,500 feet. Six of these individuals experienced aero-embolism on approximately fifteen occasions, beginning as low as 17,000 feet; in two instances the pain was incapacitating. Three individuals developed scintillating temporal scotomata during descent from 18,000 and 20,000 feet, and in two of these men unilateral temporal blindness persisted for approximately one hour after return to sea level. These individuals gave no family or personal history of migraine, and the scotomata are considered to have been a delayed manifestation of bubble formation. Pilots who make repeated rapid ascents, even to moderate altitudes, may be expected to experience bends, and perhaps visual defects, even as low as 18,000 feet. (Author)

AD-622 166 Div. 16/1 ,16/12
CFSTI Prices: HC $1.00 MF $0.50
EMORY UNIV ATLANTA GA
A COMPOSITE SENSORY PROJECTION AREA IN THE CEREBRAL CORTEX OF THE CAT,
Research rept.,
by Walter A. Mickle, and Harlow W. Ades. 23 Oct 52, 15p. Contract N9onr89800 Proj. NR140 916,NM-001 066.01.03
NAVMED , NM-001-066.01.03
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Cerebral cortex, Sensory perception), (*Sensory perception, Cerebral cortex), Brain, Nervous system, Physiology, Neurology, Vestibular apparatus, Auditory perception, End organs, Ear, Stimulation, Thalamus

Projection of the auditory, vestibular and a part of the somatic system has been shown to overlap extensively in a small cortical, area in the cat, comprising the inferior portions of the anterior ectosylvian and suprasylvian gyri and the compositive gyrus. The responses to each mode of stimulation occur with latencies which suggest that their projection is direct from thalamic relay nuclei. The projection to this area of several sense modalities which have in common their relation to posture and spatial orientation suggest the possibility of a primary cortical area of correlation. (Author)

AD-622 254 Div. 16/15,1/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
STUDIES DEALING WITH THE AUTOKINETIC ILLUSION.
Research rept.,
by Ashton Graybiel, and W. Brant Clark. 29 Apr 44, 3p. Rept. no. 1 ,NSAM-402
Proj. X148 AV V4 3
Unclassified report

Descriptors: (*Aviation medicine, Illusions), (*Illusions, Motion), Vision, Adaptation (Physiology), Flight simulators, Illumination, Marker lights, Colors, Aircraft

A progress report on experiments dealing with the autokinetic illusion is presented. The laboratory findings may have practical value in connection with the lighting of aircraft. The data and opinions, however, relate solely to the autokinetic phenomenon.

AD-622 255 Div. 16/15,1/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE EFFECT OF VARIOUS ARRANGEMENTS OF LIGHTS IN REDUCING AUTOKINESIS.
Research rept.,
by Ashton Graybiel, W. Brant Clark, and B. F. McNeal. 20 Sep 44, 17p. Rept. no. nsam-403
Proj. X148 AvV4 3
NAVMED , X-148 (Av-V4-3)-2
Unclassified report

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Descriptors: (*Aviation medicine, Illusions), (*Illusions, Motion), (*Marker lights, Aircraft), Vision, Adaptation (Physiology), Space perception, Illumination, Flight simulators, Tables

Experiments were carried out with the object of determining which of several arrangements might best be used in the exterior lighting of aeroplanes, with particular reference to the phenomenon of autokinesis. The tests were carried out in a dark room with the observers viewing one or more lights at a distance of 2 or 6 meters. In general, a progressive reduction in autokinesis was observed by increasing the number of lights and by placing them at various levels in different vertical planes. This reduction was more rapid at 2 than at 6 meters. Rows of closely spaced lights offer little advantage over single lights placed at extreme points, provided all lights are visible. (Author)

AD-622 262 Div. 16/15
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN
MONAURAL AND BINAURAL SPEECH INTELLIGIBILITY AND THE STEREOPHONIC EFFECT BASED UPON TEMPORAL CUES.
Interim rept.,
by J. Donald Harris. 1 Jun 65, 23p. Rept. no. 451 Vol. 24/No. 7
Proj. MR005 14 1001 3 06
NAVMED , MR005.14-1001-3.06
Unclassified report

Pub. in The Laryngoscope v75 n3 p428-46 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Speech, Intelligibility), (*Hearing, Speech recognition), Ear, Deafness, Earphones, Auditory signals, Stimulation, Auditory perception, Pathology

A stereo tape was prepared using three talkers separated in 30 degree azimuth steps. Nine ways of connecting the two channels to the two ears were devised, and administered to normal ears and to monaurally defective individuals. Four principles of binaural interaction were enunciated: The Principle of Binaural Gain, the Principle of Redundancy, the Principle of Blurring, and the Principle of Degradation. These principles consider the advantage of a second neural channel, a second 'look' at the stimulus with the same ear, confounding results from receiving information in one ear from noncongruent points in space, and the disadvantage of mixing signals from a normal ear and one in which signals are garbled as a result of a pathological condition. In any one person, speech intelligibility will be the algebraic resultant of whatever principles are operating at the moment. (Author)

AD-622 273 Div. 16/1 ,16/12
CFSTI Prices: HC $1.00 MF $0.50
BATTELLE MEMORIAL INST COLUMBUS OHIO

STUDY OF FLUORESCENT EMISSION FROM THE CAT CEREBRAL CORTEX.
Final rept. for Jan-Aug 64,
by Richard M. Roppel, and Arthur C. Peters.
May 65, 20p. Contract AF33 615 1206 Proj. 7232 Task 723204
AMRL , TR-65-88

Unclassified report

Descriptors: (*Cerebral cortex, Fluorescence), Brain, Tissues (Biology), Luminescence, Nervous system, Physiology, Stimulation, Pyridines, Nucleotides, Cats

Experiments were conducted to investigate the existence of changes in fluorescence properties of the cat cerebral cortex during cortical and peripheral electrical stimulation. In anesthetized cats, the exposed cortex was illuminated with the light output from a monochromator and fluorescence changes were detected by use of a photomultiplier tube. Appropriate filters were used to prevent response of the photomultiplier to light from the excitation source. When electrical pulse stimulus of electroconvulsive intensity was applied by means of a wick electrode to the brain surface, there were observed signals of several millivolts amplitude from the photomultiplier tube interpreted as fluorescence changes. An interpretation is tentatively proposed which is based upon changes in relative proportions of oxidized and reduced pyridine nucleotide in the cortical tissue. (Author)

AD-621 632 See Fld. 6/12

AD-621 780 See Fld. 2/5

AD-621 807 See Fld. 5/9

AD-621 808 See Fld. 22

AD-621 838 See Fld. 6/5

AD-621 973 See Fld. 5/10

AD-622 142 See Fld. 6/5

AD-622 155 See Fld. 5/10

AD-622 156 See Fld. 5/10

AD-622 157 See Fld. 6/5

AD-622 165 See Fld. 14/2

AD-622 169 See Fld. 5/9

AD-622 170 See Fld. 5/9

AD-622 171 See Fld. 5/9

AD-622 172 See Fld. 5/9

AD-622 173 See Fld. 5/9

AD-622 174 See Fld. 5/9

AD-622 175 See Fld. 5/9

AD-622 177 See Fld. 5/9

AD-622 180 See Fld. 5/9

AD-622 181 See Fld. 5/9

AD-622 182 See Fld. 5/9

AD-622 183 See Fld. 5/9

AD-622 184 See Fld. 5/9

AD-622 185 See Fld. 5/9

AD-622 187 See Fld. 5/9

AD-622 201 See Fld. 6/8

AD-622 217 See Fld. 5/9

AD-622 220 See Fld. 5/9

AD-622 298 See Fld. 5/10

6/17. PROTECTIVE EQUIPMENT

AD-622 043 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
NOISE ATTENUATION CHARACTERISTICS OF THE AUTOMATIC AND PRECISION COMPANY'S APM-XL EARPHONE CUSHION.
Joint project special rept. no. 6,
by Gilbert C. Tolhurst. 15 Aug 55, 13p. Contract N6onr22525 Proj. NR145 993 ,TED PEN AE1403
NSAM , SR-55-12

Unclassified report

Descriptors: (*Ear, Safety devices), (*Safety devices, Ear), Noise, Attenuation, Earphones, Thresholds (Physiology), Tests, Test methods, Performance (Engineering), Acoustic properties, Acoustic equipment

Two sets of earphone cushions (APM-XI) manufactured by the Automatic and Precision Manufacturing Company were evaluated as to their noise attenuation characteristics by methods reported previously on various personnel noise attenuation characteristics by methods reported previously on various personnel noise protective devices. The physical and subjective measures have been described in detail in Joint Project Report NM 001 064.01.16 and Special Reports 55-2 and 55-6 (Reports 4 and 5 of TED PEN 1403). The physical measures were obtained from the output of a miniature condenser microphone serving as an 'artificial ear' shock mounted within a plaster 'dummy' head. Listener threshold measures were obtained from the reported judgments of 10 observers who had received training in the listening tasks. The four listening conditions included (a) pulsed discrete frequency threshold shifts, (b) pulsed wideband and octave-bands of noise threshold shifts, (c) Spondee word reception threshold shifts, and (d) an attenuation to threshold of an 800 cps pulsed-tone and Spondee words presented at an arbitrary signal level of 114 db at the ear canal while the observer was in a masking ambient noise environment of 116 db of recorded HUP-2 noise. The AMP-XI earphone cushion in an HS-33 headset (PDR-3) does not attenuate as well as personnel some of the noise protective devices previously evaluated. However, for frequencies above 4000 cps the mean threshold values indicate equal or better attenuation than the V-51R ear warden. (Author)

AD-622 048 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
NOISE ATTENUATION CHARACTERISTICS OF THE GENTEX-RCA X-1 AND THE RCA X-2 PERSONNEL NOISE PROTECTIVE DEVICES.
Special rept. no. 18,
by Gilbert C. Tolhurst. 30 Jan 59, 15p. Rept. no. SR-59-2
Proj. TED PEN AE1403

Unclassified report

Descriptors: (*Noise, Attenuation), (*Ear, Safety devices), (*Safety devices, Ear), Speech, Intelligibility, Acoustic equipment, Acoustic insulation, Thresholds (Physiology), Audiofrequency, Tests, Test methods

An evaluation was made as to the tone, noise, and speech threshold attenuation characteristics of the Gentex RCA X-1 and the RCA X-2 personnel noise protective devices, each tested with a liquid ear cushion and a foam rubber ear cushion. Two general types of measures were obtained: (1) physical measures taken from the output of a miniature condenser microphone serving as an artificial ear mounted within a plaster manikin head; and (2) listener-observer judgments of threshold shift, normal listening versus device over the ears, to the various stimuli presented ambiently to 10 individuals. The judgments included responses to: (a) pulsed pure tone at eight discrete frequencies, (b) pulsed wide-band and octave-bands of noise, and (c) Spondee words. Both the physical and the subjective related attenuation measures show that the RCA X-2, employing both ear cushions affords as much attenuation as, or more than, the V-51R. The Gentex RCA X-1 was not so efficient as the V-51R at the lower frequencies or bands of noise but was for the higher frequency range. (Author)

AD-622 054 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
NOISE ATTENUATION CHARACTERISTICS OF THE LEE SONIC EAR-VALV.
Special rept.,
by Robert T. Camp,Jr., and Gilbert C. Tolhurst.
30 Dec 58, 9p. Rept. no. SR-58-32

Unclassified report

Descriptors: (*Noise, Attenuation), (*Ear, Safety devices), (*Safety devices, Ear), Performance (Engineering), Test methods, Tests, Acoustic equipment

The noise attenuation characteristics of the Lee Sonic Ear-Valv were obtained by both physical and loudness matching measurements. The results of all tests indicate that the Lee Sonic Ear-Valv attenuates intense and low level continuous sound and/or transient sounds to about the same degree. In other words, it appears to offer no advantages over any other ear plug. The Ear-Valv affords relatively small amounts of overall attenuation to white noise and discrete tone. (Author)

AD-622 056 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
NOISE ATTENUATION CHARACTERISTICS OF NINE PERSONNEL NOISE PROTECTIVE DEVICES.
Joint project special rept. no. 4,
by Gilbert C. Tolhurst. 10 Feb 55, 14p. Rept. no. SR-55-2
Contract N60nr22525 Proj. NR145 993 ,TED PEN AE1403

Unclassified report

Descriptors: (*Ear, Safety devices), (*Safety devices, Ear), Noise, Attenuation, Thresholds (Physiology), Airplane noise, Tests, Test methods, Acoustic properties, Acoustic equipment

Nine noise protective devices were evaluated as to their noise attenuation characteristics using two generally different methods described in detail in Joint Project Report NM 001 064.01.16 and in Special Report 54-7 (Report No. 3 of TED PEN AE 1403). Physical measures were obtained from the output of a miniature condenser microphone serving as an 'artificial ear' shock-mounted within a plaster dummy head. The subjective measures were obtained from repeated observations of 9-17 trained listeners reporting on four listening tasks. These include (a) discrete frequency threshold shift, (b) noise and octave bands-of-noise threshold shift, (c) spondee word reception threshold shift, and (d) an 800 cps and spondee word shift to threshold from a 95 db level in the ear canal in a 116 db ambient HUP-2 noise. The results indicated that two of the devices yielded more attenuation to the frequencies 125,250, and 500 cps than has been found in evaluations of previous devices. Threshold judgments of listeners wearing the V51-R ear warden varied widely from individual to individual within the listening panel and in test-retest situation on the same observers. This variability apparently was not related to possible changes in the equipment used for stimuli presentation nor to subject reliability. (Author)

AD-622 057 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
NOISE ATTENUATION CHARACTERISTICS OF FOUR ANTI-BUFFET HELMETS AND AN INSERT TYPE EAR PLUG.
Joint project special rept. no. 7,
by Gilbert C. Tolhurst. 5 Jan 56, 11p. Rept. no. SR-56-1
Contract N6onr22525 Proj. NR145 993 ,TED PEN AE1403
Unclassified report

See also AD-622 043.

Descriptors: (*Ear, Safety devices), (*Safety devices, Ear), Noise, Attenuation, Helmets, Thresholds (Physiology), Tests, Test methods, Acoustic properties, Acoustic equipment

Four prototype anti-buffet helmets, General Textile H-5-3, having special earphone cushions incorporated into them and a Dunbar-Knight Hearing Guard, insert type ear plug, were evaluated concerning their noise-tone-speech attenuation characteristics. Due to the construction of both type devices, physical measures (detailed in Joint Project Report NM 001 064.01.16) were not obtainable from the artificial ear enclosed within the plaster 'dummy' head. The limitation imposed by the lack of helmet head size ranges did not allow a full listener-observer panel to contribute to the mean attenuation values. The available personnel who 'fit' the helmets were five. These five individuals made judgments on three listening tasks which included (a) pulsed discrete frequency relative threshold shifts, (b) pulsed wide-band and octave-bands of noise relative threshold shifts, and (c) Spondee word reception relative threshold shifts. The listening observations were made under binaural, free-field conditions. None of the present devices attenuate as well as several types tested earlier, particularly in the lower end of the audible spectrum. The attenuation characteristics are probably not dissimilar to the V-51R ear warden for frequencies above 2000 cps or for octave band noise above the 600 - 1200 cps range. Two of the Gen. Tex. helmets, No. 2 and 4, attenuated Spondee words as well as the V-51R ear warden. (Author)

AD-622 061 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
NOISE ATTENUATION CHARACTERISTICS OF TWO OVER-THE-EAR TYPE PERSONNEL NOISE PROTECTIVE DEVICES.
Special rept.,
by Gilbert C. Tolhurst. 16 May 56, 12p. Rept. no. joint project rept. no. 8
Contract N6onr22525 Proj. NR145 993
NSAM , SR-56-15
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Noise, Attenuation), (*Ear, Safety devices), (*Safety devices, Ear), Speech, Intelligibility, Acoustic equipment, Tests, Test methods, Thresholds (Physiology), Acoustic insulation

Two personnel noise protective devices manufactured by the David Clark Co. were evaluated as to their noisepure tone-speech attenuation characteristics. Two general measuring techniques were employed to determine the relative effectiveness of the device 'on' versus device 'off': (1) physical measures obtained from the output of a miniature condenser microphone serving as an artificial ear within a manikin plaster head, and (2) listener-observer judgments of threshold shift of three types of ambient sound stimuli occasioned by the protective devices, listening binaurally. The data indicate that the physical measures (artificial ear) show more attenuation for the V-51R than for the 400-9 and 400-9D, except at frequencies below 1000 cps, and more attenuation for all steady-state 120 db noises used. Conversely, the listener-observer judgment data indicate slightly higher numerical threshold shift values for the 400-9 and 400-9D, except for the frequencies below 250 cps and the octave-bands below 150 - 300 cps. The Clark devices gave increased attenuation of Spondee words over that afforded by the V-51R. (Author)

AD-622 063 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
NOISE ATTENUATION CHARACTERISTICS OF A UNIVERSAL INSERT TYPE PERSONNEL NOISE PROTECTIVE DEVICE.
Special rept.,
by Gilbert C. Tolhurst. 30 Apr 57, 12p. Rept. no. 12
Contract N6onr22525 Proj. NR145 993
NSAM , SR-57-13
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Noise, Attenuation), (*Ear, Safety devices), (*Safety devices, Ear), Speech, Intelligibility, Acoustic equipment, Acoustic insulation, Thresholds (Physiology), Audiofrequency, Tests, Test methods

An evaluation was made as to the tone-noise-speech attenuation characteristics of the Mine Safety Appliance Company MSA-3A universal insert noise protective device. Two general types of measures were obtained: (1) Physical measures from the output of a miniature condenser microphone mounted as an artificial ear within a plaster manikin head; and (2) Listener-observer judgments of threshold shift, device out versus device in place, as the stimuli were presented ambiently to 10 individuals. These judgments were made concerning: (a) pulsed pure tone at eight descrete frequencies (b) pulsed wide-band and octave-bands of noise, and (c) Spondee word threshold shifts. As measured by the artificial ear the MSA-3A does not afford as much attenuation as does the V-51R. Contrarily, the relative threshold shift judgments made concerning the three listening tasks yielded higher attenuation values for the MSA-3A than for the V-51R evaluated earlier. (Author)

AD-622 066 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
NOISE ATTENUATION CHARACTERISTICS OF THE MINE SAFETY APPLIANCE 2A INSERT TYPE EAR PLUG.
Joint project special rept. no. 9,
by Gilbert C. Tolhurst. 15 Apr 56, 12p. Rept. no. SR-56-10
Contract N6onr22525 Proj. NR145 993 ,TED PEN AE1403
Unclassified report

Descriptors: (*Noise, Attenuation), (*Ear, Safety devices), (*Safety devices), Speech, Intelligibility, Acoustic equipment, Acoustic insulation, Thresholds (Physiology), Audiofrequency, Tests, Test methods

An insert type ear plug, Mine Safety Appliance 2A, was evaluated as to its noise-tone-speech attenuation characteristics. Two general techniques were employed: (1) Physical measures were obtained from the output of a miniature condenser microphone serving as an artificial ear mounted within a manikin plaster head; and (2) Listenerobserver judgments of threshold shift were made occasioned by the protective device, as the stimuli were presented ambiently, listening binaurally. Ten individuals made judgments on three listening tasks which included: (a) pulsed pure tones at eight discrete frequencies, with each individual making three judgmental series at successive time intervals (30 measures each frequency); (b) pulsed wide-band and octave-bands-ofnoise threshold shifts, one series of observations per individual (10 measures each noise band); and (c) a series of observations concerning Spondee word threshold shifts, one series per individual (10 measures). The discrete frequency threshold measures were conducted, inasfar as possible, to conform to the CHABA Report on 'Standard Method for the Measurement of the Real-Ear Attenuation of Ear Protectors.' As measured by the output of the artificial ear the MSA 2A does not afford as much attenuation as the V-51R measured previously. However, the relative threshold shift measures on the three listening tasks yielded increased attenuation values for the MSA 2A over those found for the V-51R. (Author)

AD-622 197 Div. 29/6 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
SOUND ATTENUATION CHARACTERISTICS OF THE PROJECT MERCURY PRE-PRODUCTION FULL PRESSURE SUIT HELMET.
Special rept.,
by Robert T. Camp,Jr., Gilbert C. Tolhurst, and James W. Greene. 12 Sep 60, 15p. Rept. no. SR-60-7
Unclassified report

Descriptors: (*Helmets, Pressure suits), (*Ear, Safety devices), (*Safety devices, Ear), Sound, Noise, Attenuation, Acoustic equipment, Performance (Engineering), Tests, Test methods, Thresholds (Physiology), Astronauts

To determine the sound attenuation characteristics of the Project Mercury preproduction full pressure suit helmet using two different methods: (1) Psychophysical: The differences between a trained listener's auditory thresholds for various test tones without helmet and the thresholds obtained while wearing the helmet defined the relative attenuation values at low sound pressure values. (2) Physical: Differences between sound pressures measured outside the suit and those measured under the right earphone cushion by a probe microphone were taken as attenuation values under high sound pressure level (SPL) conditions. Measurements made under low SPL conditions show that the 'real-ear' attenuation values obtained with test tones 250 cps, 500 cps, 4000 cps, 6000 cps, and 8000 cps exceeded pre-established specifications. Attenuation values obtained with test tones 125 cps, 1000 cps, 2000 cps, 3000 cps, and a wide band of noise (20 to 10,000 cps) did not meet specifications. The

attenuation measured by physical methods using as reference frequencies 125 cps, 500 cps, 1000 cps, 2000 cps, 3000 cps, 4000 cps, 6000 cps, and 8000 cps each presented at 120 db sound pressure levels did not meet specifications. (Author)

AD-622 218 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN
TESTS FOR ESTIMATING THE SIZES OF EAR DEFENDERS OF THE V-51 (R) TYPE-N.D.R.C.,
by I. A. Everley, and E. G. Emrich. 28 Feb 44, 14p. Rept. no. rept. no. 37 vol. III no. 3
NAVMED , X-233-2
Unclassified report

Descriptors: (*Noise, Attenuation), (*Ear, Safety devices), (*Safety devices, Ear), Tests, Test methods, Submarine personnel

The report is on the fittings of the V-51 (R) Ear Defender in the ears of 1007 male and 20 female subjects. The purpose of the report was to determine the proper distribution with respect to three sizes, i.e., small, medium, and large, and thereby obtain data to serve as a guide to supply officers in effecting procurement of the V-51 (R) Ear Defender.

AD-622 033 **See Fld. 22**

7/2. INORGANIC CHEMISTRY

AD-621 737 Div. 4/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
STUDYING THE PROCESS OF TITANIUM CARBIDE FORMATION PRECIPITATED FROM GASEOUS PHASE,
by V. P. Elyutin, G. I. Pepekin, and B. S. Lysov. 15 Sep 65, 14p. Rept. no. FTD-TT-65-738
TT , 65-64033
Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Chernaya Metallurgiya (USSR) v7 n3 p124-30 1964.

Descriptors: (*Titanium compounds, Carbides), (*Carbides, Synthesis (Chemistry)), Condensation reactions, Carbon tetrachloride, Chlorides, Laboratory equipment, Reaction kinetics, Hydrocarbons, Hydrogen, USSR

The method of accreting high melting carbides from gaseous phase consists in reducing the volatile halide compound of the metal into carbide with a hydrogen and hydrocarbon mixture on a preheated surface. The process is realized in a hydrogen stream at atmospheric pressure. In case the precipitation process is carried out on a graphite surface the hydrocarbon vapors may be absent in the initial mixture.

AD-621 799 Div. 4/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ULTRA PURE SUBSTANCES. ANALYTICAL CHEMISTRY OF TRACES,
by I. P. Alimarin. 15 Sep 65, 24p. Rept. no. FTD-TT-65-699
TT , 65-64048
Unclassified report

Unedited rough draft trans. of Priroda (USSR) v52 n9 p27-31 1963.

Descriptors: (*Purification, Chemical analysis), (*Chemicals, Chemical analysis), (*Chemical analysis, Reviews), Test equipment, Microanalysis, Impurities, Metallurgy, Semiconductors, Biology, Physics, USSR

A review is given of applications and methods of chemical analysis of trace elements in various substances.

AD-621 862 Div. 4/2
CFSTI Prices: HC $1.00 MF $0.50
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
INORGANIC SULFUR REAGENTS. I. THE THIONYL HALIDES,
by Charles M. Buess, Norman Kharasch, and Robert B.Langford. 1960, 15p. Contract AF49 638 718
AFOSR , 266
Unclassified report

Descriptors: (*Sulfur compounds, Halides), Oxychlorides, Oxybromides, Oxyfluorides, Iodides, Fluorochlorides, Physical properties, Chemical properties, Synthesis (Chemistry), Reviews

A review is given of the literature concerning the physical properties, chemical properties, and synthesis of thinoyl chloride ($SOCl_2$), thionyl fluoride (SOF_2), thionyl fluorochloride (SOClF), thionyl bromide ($SOBr_2$), and thionyl iodide (SOI_2).

AD-621 912 Div. 4/2 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
CATALYTIC PROPERTIES OF COMPLEX COMPOUNDS OF BORON TRIFLUORIDE,
by M. I. Vinnik, G. B. Manelis, and N. M. Chirkov. Nov 64, 9p. Rept. no. T-419-R
TT , 65-40194
Unclassified report

Trans. of Problemy Kinetiki i Kataliza (USSR) v10 p285-90 1960. Available from NRC as C-5153.

Descriptors: (*Boron compounds, Fluorides), Catalysis, Complex compounds, Carboxylic acids, Ethers, Chemical bonds, Aliphatic compounds, USSR

Quantitative kinetic data were sought that would explain the mechanism of reactions catalyzed by BF_3 compounds. A kinetic method and two model reactions--polymerization of isobutylene and decarbonylation of HC00H--were used to determine (1) the possibility of the catalysis proceeding through the stage of the formation of coordination compounds of BF_3 with reagents (aprotonic catalysis) and (2) the nature of the catalytic activity and the amount of such activity of coordination compounds of BF_3 with promoters. Aprotonic catalysis was not detected. In all reactions studied, catalysis of complex compounds of BF_3 reduced to ordinary acidic catalysis. Compounds of BF_3 with ether and with tetrahydrofuran were strong proton acids of a new type, dissociating by way of the C-H bond. The catalytic activity of the complex BF_3 compounds was quantitatively determined.

AD-622 134 Div. 4/2 ,4/3
MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY
STUDIES ON THE CHEMISTRY OF HALOGENS AND OF POLYHALIDES. XXIV. THE BEHAVIOR OF IODINE MONOCHLORIDE COMPLEXES WITH 2, 2'-BIPYRIDINES IN 1,2-DICHLOROETHANE SOLUTIONS,
by Yoshiharu Yagi, and Alexander I. Popov. 21 Dec 64, 6p. Contract DA31 124ARO D159
Unclassified report

Pub. in Journal of the American Chemical Society v87 p3577-81 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Halogen compounds, Chemical reactions), (*Halides, Complex compounds), (*Iodine compounds, Chlorides), (*Pyridines, Chemical reactions), Alkanes, Organic solvents, Polymers, Hydrochloric acid, Chlorination, Dehydration, Hydrogen compounds

Iodine monochloride complexes of 2,2'-bipyridines were prepared, and their behavior in 1,2-dichloroethane was investigated spectrophotometrically. It is shown that in this solvent the complex BP.2ICl readily dissociates into its component molecules and that BP.$HICl_2$ is then gradually formed. This reaction is evidently due to catalytic dehydrochlorination of 1,2-dichloroethane which leads to formation of hydrochloric acid and vinyl chloride. The former reacts with iodine monochloride to form $HICl_2$, while vinyl chloride either undergoes polymerization or reacts with an excess of iodine monochloride to give 2,2-dichloro-1iodoethane. (Author)

AD-622 275 Div. 4/2 ,17/4
CFSTI Prices: HC $2.00 MF $0.50
LEDOUX AND CO INC TEANECK N J
EVALUATION OF ANALYTICAL METHODS FOR THE DETERMINATION OF INTERSTITIALS IN MOLYBDENUM AND TUNGSTEN.
Final rept. for 15 Jun 64-31 May 65,
by Silve Kallmann, Robert Liu, Hans Oberthin, Richard Stevenson, and Frank Lux. Aug 65, 48p. Contract AF33 615 1689 Proj. 7360 Task 736005
ML , TR-65-194
Unclassified report

Descriptors: (*Molybdenum, Impurities), (*Tungsten, Impurities), (*Chemical analysis, Refractory metals), Oxygen, Carbon, Hydrogen, Nitrogen, Determination, Radioactivation analysis, Neutron activation, Vacuum apparatus, Melting, Test methods

Analytical methods covering the determination of interstitial elements in tungsten and molybdenum (oxygen, carbon, hydrogen and nitrogen) were evaluated. Two samples of tungsten and two samples of molybdenum were analyzed for oxygen by vacuum fusion, inert gas fusion, and neutron activation techniques. Carbon methods investigated included combustion, followed by a coulometric, conductometric, or thermoconductometric finish, and also irradiation with 25 Mev gamma rays. Hydrogen methods evaluated were based on vacuum fusion and vacuum extraction. Nitrogen results became available either as a by product of vacuum fusion techniques or were obtained by variations of the micro-Kjeldahl procedure. The evaluation indicates that in competent hands a variety of techniques is capable of providing satisfactory results for oxygen, carbon and hydrogen. No proven chemical or instrumental method is available for the determination of less than 10 ppm of nitrogen. (Author)

AD-622 300 Div. 4/2 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN CHEMICALS DIV
CHEMISTRY OF DECABORANE-PHOSPHORUS COMPOUNDS. VI. PHOSPHINO-M-CARBORANES.
Technical rept.,
by Roy P. Alexander, and Hansjuergen Schroeder. Oct 65, 8p. Rept. no. TR-27
Contract Nonr339500 Proj. 356 431
Unclassified report

See also AD-602 087.

Descriptors: (*Decaboranes, Synthesis (Chemistry)), (*Organoboranes, Synthesis (Chemistry)), (*Phosphinoborines, Synthesis (Chemistry)), (*Bromine compounds, Decaboranes), Chlorides, Phosphines, Boron compounds, Heterocyclic compounds, Polymers, Molecular weight

Reactions between m-B10H10C2Li2 and chlorophosphines were conducted, and the chemistry of the products obtained was investigated. No indication of a cyclic monomeric product was observed. In reacting two molar equivalents of PCl3 and one molar equivalent of m-B10H10C2Li2, m-B10H10C2 (P.Cl2) was obtained in 40% yield only, together with a product the consistency of which varied between highly viscous and brittle from run to run. Treatment of this by-product with methanol produced a polymeric solid. When the same reactants were combined in a 1:1 molar ratio, still some m-B10H10C2 (P.Cl2)2 was obtained. Although the yield of polymeric product increased, the chain length remained unchanged. Reaction of the analogous m-B10H9BrC2Li2 with PCl3 did not afford the noncyclic monomer but a pasty product from which an oligomer was obtained by treatment with methanol. From these results it appears that this type of reaction leads only to polymeric products of limited molecular weight. These polymers consisting of a number of phosphorus-linked m-carborane nuclei are believed to be linear since they resemble metal-linked poly-mcarboranes of established chain structure. (Author)

AD-621 656 See Fld. 20/2

AD-621 667 See Fld. 7/4

AD-621 724 See Fld. 7/4

AD-622 098 See Fld. 11/3

AD-622 135 See Fld. 6/1

AD-622 278 See Fld. 21/9

7/3. ORGANIC CHEMISTRY

AD-621 626 Div. 4/3
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY
CONFORMATIONAL ANALYSIS, XLIV. THE DEPENDENCE OF SOME PHYSICAL PROPERTIES OF ACETOPHENONE DERIVATIVES ON THE CONFORMATION OF THE SIDE CHAIN,
by Norman L. Allinger, and Edward S. Jones. 4 Jan 65, 5p. Contract DA ARO D31 124G375

AROD , 2674:11

Unclassified report

Pub. in Journal of Organic Chemistry v30 p2165-9 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stereochemistry, Ketones), (*Ketones, Stereochemistry), Molecular isomerism, Fluorine compounds, Amines, Alcohols, Carboxylic acids, Chemical equilibrium, Nuclear magnetic resonance, Spectra (Visible + ultraviolet), Chemical bonds, Atomic orbitals

A series of compounds (rhenyl ketones with para H, F, NH2, OH, or COOH and with a C5-C8 group attached to the carbonyl carbon were studied with respect to pK values and n.m.r. and ultraviolet spectra. Earlier conclusions regarding the interpretation of the data on the rho-sigma basis are confirmed for the most part, but it is shown that the ultraviolet data cannot be so correlated reliably. The theoretical implications of these facts are considered. (Author)

AD-621 734 Div. 4/3
WASHINGTON UNIV SEATTLE DEPT OF CHEMISTRY
ELECTRON SPIN RESONANCE OF TROPENYL RADICAL,
by Gershon Vincow, M. Lee Morrell, Walter V. Volland, Hyp J. Dauben,Jr., and Frank R. Hunter. 5 Jun 65, 4p. Contract DA ARO D31 124G254, DA ARO D31 124G362
AROD ,AROD 2830:5, ,3453:4

Unclassified report

Pub. in Journal of the American Chemical Society v87 p3527-8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Free radicals, Microwave spectroscopy), (*Monocyclic compounds, Free radicals), Chemical bonds, Thermal properties, Hyperfine splitting, Nuclear magnetic resonance

The tropenyl radical was obtained from bitropenyl by thermal C-C bond cleavage at elevated temperatures. The principle electron spin resonance results obtained were a temperature dependence of the proton hyperfine splitting, and the carbon-13 splitting and its temperature dependence.

AD-621 837 Div. 4/3
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY
MOLECULAR ASYMMETRY OF OLEFINS. IV. KINETICS OF RACEMIZATION OF (+ OR -)-TRANS-CYCLOOCTENE,
by Arthur C. Cope, and Beverly A. Pawson. 18 Feb 65, 3p. Contract DA ARO D31 124G404 ,NSF GP1587
AROD , 1112:22

Unclassified report

Pub. in Journal of the American Chemical Society v87 n16 p3649-50 Aug 20 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Alkenes, Stereochemistry), (*Stereochemistry, Alkenes), (*Monocyclic compounds, Stereochemistry), (*Molecular rotation, Monocyclic compounds), Reaction kinetics, Optical properties, Thermal properties, Enthalpy, Heat of activation, Molecular isomerism

Thermal racemization of optically active (+ or -)-transcyclooctene was studied at 132.7, 156.4, and 183.9C. The reaction was found to be first order in olefin. Half-life values were 122, 15, and 1 hr., respectively, for the three temperatures. The racemization reaction had an activation energy of 35.6 kcal./mole. The enthalpy, free energy, and entropy of activation were calculated at 155.3C. (Author)

AD-622 131 Div. 4/3
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C
NUCLEOPHILIC DISPLACEMENT OF BROMIDE BY THIOSULFATE ION FROM 1,2-AMINOBROMOPROPANES,
by Daniel L. Klayman, James W. Lown, and Thomas R.Sweeney. 1 Sep 64, 4p.

Unclassified report

Pub. in Journal of Organic Chemistry v30 p2275-8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Alkanes, Displacement reactions), (*Bromides, Displacement reactions), (*Thiosulfates, Displacement reactions), Halogenated hydrocarbons, Amines, Organic sulfur compounds, Ions, Sulfites

In the reaction of 2-amino-1-bromopropane hydrobromide (II) with 1 equiv. of sodium thiosulfate, the formation of only one product, 2-aminopropane-1-thiosulfuric acid (IV), is detected. Similar treatment of 1-amino-2-bromopropane hydrobromide (I) yields two products, namely, 1-aminopropane-2-thiosulfuric acid (III) and the rearranged product, IV. In order to determine whether an ethylenimonium ion is an intermediate in the formation of IV in the latter reaction, the ring opening of 2-methylethylenimine by thiosulfate ion was investigated. The direct displacement of bromide in I by thiosulfate ion without the intermediacy of the cyclic imonium ion accounts for the formation of III. The ratio of the rate constants for the intramolecular displacement vs. the intermolecular displacement was found to be 1.45. (Author)

AD-622 136 Div. 4/3 ,16/11
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DEPT OF MEDICINAL CHEMISTRY
THE SYNTHESIS OF AMINOETHYL-SUBSTITUTED SELENIUM COMPOUNDS,
by Daniel L. Klayman. 12 Jan 65, 3p.

Unclassified report

Pub. in the Journal of Organic Chemistry, v30 p2454-6 Jul 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Selenium compounds, Amines), (*Radioprotective agents, Selenium compounds), Synthesis (Chemistry), Substitution reactions, Organic sulfur compounds, Organic compounds

Several aminoethylselenium compounds were, synthesized for evaluation as potential radioprotective drugs and for comparison with their sulfur analogs.

AD-622 138 Div. 4/3
CINCINNATI UNIV OHIO DEPT OF CHEMISTRY
PENTACHLOROPHENYL ORGANOMERCURY COMPOUNDS,
by F. E. Paulik, S. I. E. Green, and R. E. Dessy. 20 Jul 64, 5p. Contract DA ARO D31 124G141

AROD , 3118:7

Unclassified report

Pub. in Journal of Organometallic Chemistry v3 p229-32 1965 (Copies available only to DDC users).

Descriptors: (*Metalorganic compounds, Mercury compound's), Aromatic compounds, Chlorides, Fluorides, Chemical bonds, Synthesis (Chemistry)

The following pentachlorophenyl derivatives of mercury have been prepared; (C6Cl5)2Hg, C6Cl5HgCl, C6Cl5HgCH3 and C6Cl5HgC6H5, Acid attack on the latter two species leads to scission of the C6Cl5-Hg and C6H5-Hg bonds respectively, in agreement with the C6F5-Hg compounds. Like the latter, these pentachlorophenyl derivatives have a very high thermal stability. The ease of preparation and cost-differential compared to the fluorine derivative and the possibility for metal-ring halogen interaction suggest this grouping as deserving of further investigation. (Author)

AD-622 149 Div. 4/3
MICHIGAN UNIV ANN ARBOR DEPT OF CHEMISTRY
POLAROGRAPHIC DETERMINATION OF OPHENYLENEDIAMINE. INCREASE IN SENSITIVITY BY EMPLOYING LITHIUM IODIDE AS SUPPORTING ELECTROLYTE,
by Lowell R. McCoy, and Harry B. Mark,Jr.. 1965, 2p. Contract DA31 124ARO D284

Unclassified report

Pub. in Analytical Chemistry v37 p591-2 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Amines, Polarographic analysis), Aromatic compounds, Lithium com-

pounds, Iodides, Mercury, Electrodes, Sensitivity, Electrolytes

A variation is reported whereby the sensitivity of an indirect polarographic method for determination of o-phenylenediamine can be increased in the range of 10 to the minus 7th power by using LiI in 0.1M concentration as the supporting electrolyte. The method is based on the catalytic polarographic prewave observed when Ni (II) is reduced at a dropping mercury electrode.

AD-622 279 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
OREGON UNIV EUGENE
ORGANIC CHEMISTRY: 1,3-DIPOLAR ADDITIONS.
Final rept. for 28 Jul 62-27 Jul 65,
by V. Boekelheide. 27 Jul 65, 7p. Contract ARO D31 124G377
AROD , 3719:3

Unclassified report

Descriptors: (*Heterocyclic compounds, Synthesis (Chemistry)), (*Organic nitrogen compounds, Heterocyclic compounds), Chemical reactions, Organic chemistry

Investigations of dipolar addition reactions of heterocyclic organic nitrogen compounds were carried out. Four parent compounds were investigated. There were N-aminopyridenes, imidizoles, tetracyanoethylene oxide, and 4,8, diazapentalenes.

AD-621 665 **See Fld. 6/1**

AD-621 670 **See Fld. 6/1**

AD-621 790 **See Fld. 14/2**

AD-621 818 **See Fld. 21/4**

AD-621 819 **See Fld. 21/4**

AD-621 874 **See Fld. 21/4**

AD-621 882 **See Fld. 21/4**

AD-621 912 **See Fld. 7/2**

AD-621 927 **See Fld. 7/4**

AD-622 098 **See Fld. 11/3**

AD-622 134 **See Fld. 7/2**

AD-622 140 **See Fld. 7/4**

AD-622 300 **See Fld. 7/2**

7/4. PHYSICAL CHEMISTRY

AD-621 667 Div. 4/4 ,4/2
MINNESOTA UNIV MINNEAPOLIS SCHOOL OF CHEMISTRY
EQUILIBRIA IN ETHYLENEDIAMINE. III. DETERMINATION OF ABSOLUTE PK VALUES OF ACIDS AND SILVER SALTS. ESTABLISHMENT OF A PH AND PAG SCALE,
by L. M. Mukherjee, Stanley Bruckenstein, and F. A. K. Badawi. 4 Jan 65, 8p. Contract DA ARO D31 124G275
AROD , 3165:3

Unclassified report

Pub. in Journal of Physical Chemistry v69 n8 p2537-44 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ethylenediamine, Chemical equilibrium), (*Hydrochloric acid, Dissociation), (*Silver compounds, Dissociation), Chemical indicators, Reaction kinetics, Electrochemistry, Electrodes, Acid-base reactions, Electrical properties

The dissociation constant for the reaction HCl (Reversibly yields) H (+) + Cl (-) in ethylenediamine was determined by spectrophotometric and cryoscopic measurements. The mean value of pK (HCl), 4.01 was used to calculate the potential of the saturated corrosive sublimate electrode (s.c.s.e.) and E (Ag+,Ag) using electrodes of the first and second kinds. E.m.f. values obtained with the hydrogen electrode in solutions of acids and in solutions of salts were used to calculate pK values of acids. Similarly, from e.m.f. values obtained using the silver electrode in silver salt solutions, the corresponding pK values were evaluated. Cryoscopic determination of the pK value for hydrobromic acid in ethylenediamine is also reported. (Author)

AD-621 719 Div. 4/4
CFSTI Prices: HC $2.00 MF $0.50
AMERICAN OIL CO WHITING IND
THE RADIATION CHEMISTRY OF ACETYLENIC COMPOUNDS.
Final rept. for 1 Dec 61-1 May 65,
by R. E. Rondeau, and L. A. Harrah. Jul 65, 35p. Contract AF33 616 8247 Proj. 7360 Task 736003
ML , TR-65-236

Unclassified report

Descriptors: (*Aliphatic compounds, Radiation chemistry), (*Radiation chemistry, Aliphatic compounds), Nitriles, Chemistry bonds, Cyanides, Gas analysis, Chromatographic analysis, Hydrocarbons, Reaction kinetics

G-values for radiolysis products were determined for propyne and butyne-1 in the vapor phase and for butyne-1, butyne-2, pentyne-1, pentyne-2, hexyne-3, acetonitrile and propionitrile in the liquid phase. The rupture of a C-H bond probably from a carbon beta to the triple bond results in H2, coupling products, and H atom addition. H atom addition leads to mono and poly olefins. The rupture of a C-C bond results in fragmentation in the vapor phase but recombination to form 1,2-diolefins in liquid phase. Both alpha and beta C-C bond rupture occur. Alkyl benzene--alkyne trimers--form, probably by excitation. Analogous C3N3 ring compounds may form but were not detected. Gas chromatography techniques for alkyne and nitrile analyses are described. (Author)

AD-621 724 Div. 4/4 ,4/2
ILLINOIS INST OF TECH CHICAGO DEPT OF CHEMISTRY
NORMAL COORDINATE ANALYSES OF HYDROGENBONDED COMPOUNDS. IV. THE ACID CARBONATE ION,
by Kazuo Nakamoto. 15 Apr 65, 5p.
AROD , 3899:5

Unclassified report

Pub. in Journal of Chemical Physics v43 n4 p1177-81 15 Aug 1965 (Copies not available to DDC or Clearinghouse customers). See also AD-616 074.

Descriptors: (*Chemical bonds, Spectra (Infrared)), (*Infrared spectroscopy, Carbonates), (*Carbonates, Spectra (Infrared)), Potassium compounds, Deuterated compounds, Crystals, Raman spectroscopy, Band spectrum, Ions

The infrared spectra of potassium acid carbonate and its deutero analog were obtained from 4000 to 160/cm. The Raman spectrum of the latter was also obtained in the crystalline state. A normal coordinate analysis was carried out to estimate the force constants as well as to make theoretical band assignments. The infrared bands of the nondeuterated compound at about 2620, 1405, and 248/cm were assigned to the O-H stretching, O-H...O inplane bending, and O...H stretching coupled with C=O bending modes, respectively. The corresponding force constants are: O-H stretching, 3.20, O-H...O bending, 0.22, and O...H stretching, 0.76 mdyn/A. Plots of these force constants versus O-H...O distances for three compounds thus far investigated yield a linear relationship for each force constant. (Author)

AD-621 752 Div. 4/4 ,25/7 ,15/2
CFSTI Prices: HC $2.00 MF $0.50
PARKE MATHEMATICAL LABS INC CARLISLE MASS
MATHEMATICAL ASPECTS OF ANALYSIS OF VARIANCE AND ITS APPLICATION IN A STATISTICAL ANALYSIS OF MEASUREMENTS WITH MS-7 MASS SPECTROMETER.
Scientific rept.,
by N. Grier Parke,III.. May 65, 31p. Rept. no. SR-3
Contract AF19 628 2419 Proj. 5620 Task 562002
AFCRL , 65-478

Unclassified report

Descriptors: (*Analysis of variance, Mass spectroscopy), (*Mass spectroscopy, Analysis of variance), Determination, Impurities, Spectrum analyzers, Metals

An application of the Analysis of Variance to the evaluation of the effects of major controllable parameter in the use of an MS-7 Mass Spectrometer for the determination of amounts of impurities. (Author)

AD-621 845 Div. 4/4 ,7/4 ,14/6
CFSTI Prices: HC $3.00 MF $0.75
AMERICAN CYANAMID CO STAMFORD CONN CENTRAL RESEARCH DIV
CHEMILUMINESCENT MATERIALS.
Technical rept. no. 9, 1 Jun-31 Aug 65,
by M. M. Rauhut, L. J. Bollyky, R. A. Clarke, M. Loy, and B. G. Roberts. 30 Sep 65, 78p. Rept. no. 06-1432-25-Q9
Contract Nonr420000 Proj. NR356 452 ,ARPA order 299

Unclassified report

See also AD-610 435.

Descriptors: (*Lighting equipment, Materials), (*Luminescence, Chemical reactions), Fluorescence, Halogenated hydrocarbons, Oxychlorides, Hydrogen peroxide, Intensity, Anhydrides, Oxlates, Polycyclic compounds, N-heterocyclic compounds, Spectra (Infrared), Reaction kinetics, Free radicals

Progress toward the development of chemiluminescent systems for application to chemical lighting is reported. A mechanistic study of the chemical processes involved in the oxalyl chloride-hydrogen peroxide-fluorescer chemiluminescent reaction was completed and the mechanism of the reaction is discussed. A preliminary study is reported on the effects of reaction conditions on chemiluminescent intensities, lifetimes, quantum yields and radiation capacities of oxalic anhydride and oxalic ester reactions with hydrogen peroxide in the presence of 9,10-diphenylanthracene. Quantum yields were found to decrease with increasing concentration of the oxalic acid derivatives. A series of sixteen oxalic esters were examined qualitatively for chemiluminescence under a variety of reaction conditions. Superior results were found for esters containing electronegative substituents. Reactions of 5-hydroxytetrazole, octahydroxycyclobutane, and related compounds with hydrogen peroxide in the presence of 9,10-diphenylathracene were not chemiluminescent. (Author)

AD-621 881 Div. 4/4 ,20/1
CFSTI Prices: HC $1.00 MF $0.50
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
THEORY OF SCATTERING OF MOLECULAR BEAMS IN GASES,
by Taro Kihara. 16 Jul 65, 17p.
TT , 65-64082

Unclassified report

Trans. of Physico-Mathematical Society of Japan, Tokyo. Proceedings, v25 Ser3 p73-86 1943.

Descriptors: (*Molecular beams, Scattering), Differential cross section, Power series, Hydrogen, Mercury, Gases, Potential theory, Japan

The differential cross section for molecular beams with uniform and non-uniform velocities is obtained in power series in powers of theta and pi - theta (where theta is the scattering angle in the center-of-mass system) for intermolecular potentials of the form U (r) = lambda (1/r to the nth power); and they are numerically calculated for integral n between 6 and 14. The quantum mechanical effects are neglected. The cross sections obtained are compared with the experimental results of Knauer for the scattering of a H2 beam in Hg gas and the intermolecular potential between H2 and Hg is determined to be U (r) = 273k (3.5/r) to the 7th power, (r in A, k = Boltzmann constant). (Author)

AD-621 927 Div. 4/4 ,4/3 ,25/7
LOYOLA UNIV CHICAGO ILL DEPT OF CHEMISTRY
PHOTOIONIZATION AND DELAYED FLUORESCENCE OF DYES IN RIGID ORGANIC MATRICES. I. A. PROPOSED MODEL,
by E. C. Lim, C. P. Lazzara, M. Y. Yang, and G. W. Swenson. 9 Mar 65, 6p. Contract DA ARO D31 124G391
AROD , 2459:9

Unclassified report

Pub. in the Journal of Chemical Physics v43 n3 p970-4 1 Aug 1965 (Copies not available to DDC or Clearinghouse customers). Presented at the Symposium on Molecular Structure and Spectroscopy, Ohio State Univ., Columbus, Jun 1964.

Descriptors: (*Fluorescence, Dyes), (*Dyes, Fluorescence), Photochemistry, Photoelectric effect, Ionization, Excitation, Molecules, Fluorescence, Organic materials

The decay modes of the delayed fluorescence from rigid-glass solutions of acridine dyes at 77K have been studied and compared with those of the transient absorptions which have previously been assigned to the radical ions produced from photoionization. While the decay of the radical-ion absorption is nearly exponential from the beginning, the decay of the emission is highly nonexponential and becomes approximately exponential only in the later stage of decay. The lifetime of the 'exponentially' decaying component of the emission is identical with that of the 'radical ion.' Although flash and steady excitations produce considerably different initial decay for the emission, the decay rate of the absorption shows very little or no dependence on the excitation mode. Both the integrated intensity of the delayed fluorescence and the initial absorbance of the radical-ion absorption are directly proportional to the intensity of the monochromatic flashexcitation source. These, as well as other results, are interpreted in terms of a model requiring the formation of solute-solvent charge-transfer states from the excited singlet states of the solute molecules as the primary process in photoionization. It is assumed that charge-transfer states which are unstable with respect to a complete charge separation dissociate and produce radical ions (holes) and trapped electrons, while the more stable ones return slowly to the excited singlet state by thermal activation. (Author)

AD-622 125 Div. 4/4 ,25/7
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF
EVALUATION OF APPROXIMATIONS USED IN THE CALCULATION OF EXCITATION BY COLLISION. I. VIBRATIONAL EXCITATION OF MOLECULES,
by T. E. Sharp, and D. Rapp. 18 Mar 65, 12p.

Unclassified report

Pub. in The Journal of Chemical Physics v43 n4 p1233-44 15 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Excitation, Molecules), (*Vibration, Excitation), Perturbation theory, Probability, Quantum mechanics, Harmonic oscillators, Series, Differential equations, Digital computers

Approximate procedures for calculating transition probabilities for excitation by molecular collision are examined in terms of a simplified model, vibrational excitation of a harmonic vibrator by collinear collision with an atom. Digital-computer solutions were obtained for the coupled differential equations resulting from time-dependent perturbation theory with an expansion of the total wavefunction in terms of eigenfunctions of the target molecule. Calculations with the expansion truncated at 2, 3, ..., 10 states show that, as the collision velocity is increased, more states must be included to obtain an 'exact' solution. For single quantum transitions j to j + 1 at low velocities, the first-order perturbation approximation results are reliable up to probabilities of about 0.1; at higher velocities, they greatly exceed the 'exact' results. The two-state approximation always yields drastic underestimates. For multiple quantum transitions at all velocities, the first-order perturbation calculation greatly underestimates the transition probability because it includes only the direct transition j to k and excludes the stepwise transitions during a single collision j to j + 1 to ... to k - 1 to k. To evaluate this dominant process, a multiple-step perturbation theory was developed. The resulting equation for a harmonic oscillator, gives excellent predictions in the low velocity range. For higher collision velocities, a computer calculation employing many eigenfunctions is required. The relationship of these results to calculation of other inelastic collision processes is discussed briefly. (Author)

AD-622 126 Div. 4/4 ,9/1
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
SHEAR-RELAXATION PROCESSES IN LIQUIDS,
by G. C. Knollman, D. O. Miles, and A. S. Hamamoto. 19 Apr 65, 11p.

Unclassified report

Pub. in The Journal of Chemical Physics v43 n4 p1160-70 Aug 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Shear stresses, Liquids), (*Relaxation time, Shear stresses), Perturbation theory, Kinetic theory, Dielectric properties, Impurities, Aromatic compounds

Both cooperative behavior, involving breakup and reformation of molecular aggregates, and environmental dissimilarities, attributed to incompleteness of shortrange order, have been proposed earlier by two of the authors as possible mechanisms giving rise to the distribution of shear-relaxation times exhibited by most liquids. Experimental evidence is presented giving qualitative indication that environmental-dissimilarity effects indeed can be operative in a liquid together with cooperative phenomena. Shear-relaxation characteristics are studied at a number of temperatures for a host liquid, hexachlorobiphenyl, having methanol and toluene in various concentrations as separate impurity liquids. Small amounts of the additive liquids are found to lessen the decay rate of cooperative behavior with increasing temperature, a result attributed to both degraded cooperative behavior and an environmental-dissimilarity mechanism. Although cooperative behavior predominates throughout the temperature and concentration range investigated, in the low-temperature region the impurity additive primarily decomposes aggregates of cooperative molecules, whereas at higher temperatures the impurity markedly enhances environmental dissimilarities and the distribution function widens with increasing (small) concentration. Toluene impurity additive displays greater degradation effect on cooperative behavior as well as greater enhancement of environmental dissimilarities than does methanol. (Author)

AD-622 140 Div. 4/4 ,4/3
CINCINNATI UNIV OHIO DEPT OF CHEMISTRY
A KINETIC AND MECHANISTIC STUDY ON THE CLEAVAGE OF THE CARBON-BORON BOND. THE IMPORTANCE OF COORDINATION,
by Louis H. Toporcer, Raymond E. Dessy, and Stuart I. E. Green. 3 Sep 64, 5p. Contract DA ARO D31 124G141
AROD , 3118:8

Unclassified report

Pub. in the Journal of the American Chemical Society v87 n6 p1236-40 Mar 20 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Organoboranes, Chemical bonds), Carbon compounds, Boron compounds, Metalorganic compounds, Dynamics, Mechanics, Carboxylic acids

The mechanism of the reaction of triethylboron with carboxylic acids has been examined kinetically in aprotic solvents. The reaction is first order in each reagent, and log k sub 2 is an inverse function of the pK sub a of the acid. A Taft correlation (rho asterisk = -0.94) is observed. The effect of added nucleophiles and a primary isotope effect (K (RCOOH)/K (RCOOD) = 3.3) indicate that pre-ratedetermining nucleophilic coordination of the organoborane by the oxy functions of the acid occurs, a step which activates both the incipient carbanion and the electrophilic hydrogen of the acid. (Author)

AD-621 656 See Fld. 20/2

AD-621 767 See Fld. 11/9

AD-621 824 See Fld. 10

AD-621 827 See Fld. 20/8

AD-622 019 See Fld. 18/8

AD-622 097 See Fld. 20/4

8/2. CARTOGRAPHY

AD-621 736 See Fld. 14/5

8/6. GEOGRAPHY

AD-621 721 Div. 2/5 ,2/10
CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB
RELATIONSHIP BETWEEN SEISMICITY AND

GEOLOGIC STRUCTURE IN THE SOUTHERN CALIFORNIA REGION,
by C. R. Allen, P. St. Amand, C. F. Richter, and J. M. Nordquist. 15 Mar 65, 47p. Contract AF49 638 1337 Grant ,NSF GP2806
Unclassified report

Pub. in Bulletin of the Seismological Society of America v55 n4 p753-97 Aug 1955.

Descriptors: (*Structural geology, California), (*California, Structural geology), (*Seismology, Structural geology), Seismic waves, Seismological stations, Seismographs, Earthquakes, Faults (Geology)

Data from 10,126 earthquakes that occurred in the southern California region between 1934 and 1963 have been synthesized in the attempt to understand better their relationship to regional geologic structure, which is here dominated by a system of faults related mainly to the San Andreas system. Most of these faults have been considered 'active' from physiographic evidence, but both geologic and short-term seismic criteria for 'active' versus 'inactive' faults are generally inadequate.

AD-622 192 Div. 2/5
CFSTI Prices: HC $1.00 MF $0.50
MIAMI UNIV CORAL GABLES FLA
THEORY OF DENSIFICATION OF DRY, BUBBLY GLACIER ICE,
by Henri Bader. Jul 65, 22p. Contract DA11 190eng91 Task DA1V014501B52A31 CRREL , RR-141
Unclassified report

Descriptors: (*Glaciers, Density), (*Ice, Glaciers), Greenland, Ice islands, Porosity, Air, Bubbles, Pressure, Measurement

Density and air bubble pressure data obtained from ice cores from Site 2, Greenland, are analyzed to determine porosity at the pore close-off level, which is found to have a very small standard deviation. A theory of densification of bubbly ice is developed on the simple assumption that the rate of decrease in porosity is proportional to porosity and also proportional to the difference between absolute load pressure and air bubble pressure. The theory is remarkable in that it has led to derivation of a useful equation for approximating the value of the integral exp t to the m power (dt) for m > 0. (Author)

AD-622 193 Div. 2/5 ,9/1
CFSTI Prices: HC $2.00 MF $0.50
ARMY COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H
ON ISOTHERMAL FLOW OF AIR INTO A PARTIALLY CASED RECTANGULAR SNOW TRENCH,
by Yin-Chao Yen. Jun 65, 30p. Rept. no. RR-167
Task DA 1V014501B52A31
Unclassified report

Descriptors: (*Snow, Permeability), (*Fluid flow, Snow), Gas flow, Two-dimensional flow, Porous materials, Mathematical analysis

In a previous paper, Yen and Fisher (PB-167 436) developed an expression for evaluating the quantity of air flowing into a partly cased rectangular porous trench of constant permeability. The flow was assumed to be isothermal, steady and two-dimensional. The formula is Q = 2 (K sub 1'/2 K sub 1) (K/mu) (rho sub avg) (P sub s - P sub w), where Q is the mass flow rate per unit length of the trench, K sub 1'/2 K sub 1 is a configuration factor; k is permeability, mu is viscosity of air; rho sub avg is the average density at mean pressure; and p sub s and p sub w are the air pressures at the trench top and the uncased trench walls respectively. The configuration factor in this earlier work was arrived at by considering the effects of depth to the impermeable layer, d sub l, depth of the trench, d sub t, and depth of the trench casing, d sub c. In the present study, however, values of K sub 1'/2 K sub 1 were determined which included the effect of half trench width b as well as d sub l, d sub t and d sub c. It is found that in any practical analysis the effect of trench width is not negligible and should be considered. (Author)

AD-622 073 **See Fld. 4/2**

AD-622 228 **See Fld. 8/14**

AD-622 263 **See Fld. 8/10**

8/7. GEOLOGY AND MINERALOGY

AD-621 826 Div. 2/8 ,13/3
CFSTI Prices: HC $4.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK MATERIALS RESEARCH LAB
THERMODYNAMICS AND KINETICS OF THE DEHYDROXYLATION OF HYDROUS MINERALS.
Final rept. for Aug 64-Jun 65,
by G. W. Brindley, and Rustum Roy. Jun 65, 113p. Contract AF19 628 2773 Proj. 0000 Task 000011
AFCRL , 65-606
Unclassified report

See also AD-607 879.

Descriptors: (*Moon, Water supplies), (*Water supplies, Minerals), (*Minerals, Dehydration), Raolinite, Temperature, Vapor pressure, Water vapor, Rock (Geology), Reaction kinetics, Thermodynamics, Lunar environment, Heat of reaction, Diffusion, Solar wind, Hydroxides

The evolution of water from serpentine and kaolinite has been studied in relation to temperature and water vapor pressure. For both minerals, the dehydroxylation reaction is controlled primarily by a diffusion process. Additional data are presented for the dehydroxylation of brucite which show the intrinsic difficulties of establishing the basic dehydroxylation mechanisms of hydrous minerals. The previously reported high pressure dehydration data are extended to the mineral diaspore, and additionally a summary is provided of the temperatures of dehydration of a number of minerals at water vapor pressures of 1 atm, 100 psi, 1000 psi, and 10,000 psi, together with values for the heats of reaction, deltaH, in cal/g of mineral at 1 atm. vapor pressure. A preliminary exploration was made of the possible effects of proton bombardment (such as can arise by solar wind on the lunar surface) on retention of protons by minerals, and on their dehydration behavior. Insofar as protons are captured, there is the possibility of an additional source of lunar water and insofar as minerals are disordered by the bombardment, there is the possibility of an easier release by hydroxyl water. The tentative results obtained indicate the possibility of both these effects, though their magnitude under lunar conditions and with geological time are still unknown.

AD-622 104 Div. 2/8
ASTROPHYSICAL OBSERVATORY SMITHSONIAN INSTITUTION CAMBRIDGE MASS
THE GROWTH OF THE WIDMANSTATTEN PATTERN IN METALLIC METEORITES,
by J. I. Goldstein, and R. E. Ogilvie. 30 Oct 64, 31p.
Unclassified report

Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy. Pub. in Geochimica et Cosmochimica Acta v29 p893-920 1965 (Copies available only to DDC users).

Descriptors: (*Petrology, Meteorites), (*Meteorites, Phase studies), (*Astrophysics, Meteorites), Extraterrestrial topography, Metallic crystals, Crystal growth, Iron, Nickel, Geochemistry

The effects of pressure, temperature and time on the formation of the Widmanstatten pattern found in metallic meteorites have been established. A means of analysis, using the method of finite differences, was developed for the study of the diffusion-controlled growth of the Widmanstatten pattern. The growth analysis accounted for (1) the change of D with Ni concentration; (2) the change of D and the Fe-Ni phase diagram with pressure; (3) the average meteorite composition; (4) the radius of the parent body and the pressure within it; (5) the degree of undercooling before precipitation took place; and (6) the distance between precipitates. The individual effect of each of these factors was determined and displayed in the form of parametric curves. Two cooling models with low internal pressure and two with high internal pressure were examined for the formation of the Widmanstatten pattern. These models were used to determine the temperature-time relationship in the growth analysis. Excellent agreement between the measured and the calculated taenite composition gradients was found for the low-pressure (< 12 kb) models. The formation of plessite, the development of the two phase structures in ataxites, and the decrease in Ni concentration in the kamacite near the alpha/gamma boundary are all explained in terms of a low-pressure model. (Author)

AD-622 241 Div. 2/8 ,2/1
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
METEORITES.
12 May 64, 61p. Rept. no. AID-U-64-35 TT , 65-64129
Unclassified report

Trans. of Meteoritika (USSR) n20 p172-6; n21 p52-9 1961: n22 p71-3, 74-82, 104-9, 1962. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Meteorites, Chemical analysis), (*Petrology, Meteorites), Extraterrestrial topography, Minerals, Iron, Infrared spectroscopy, USSR, Astronomy

Contents: Development of a mineralogy of meteorites; Composition of 18 stony meteorites from the collection of the USSR Academy of Science; Chemical composition of the chandruler of the Nikol'skoye and Saratov Meteorites; relationship of various forms of iron in chondriter; methods of studying meteorites and tektites with the help of infrared spectrometry.

AD-621 955 **See Fld. 13/6**

AD-622 072 **See Fld. 20/14**

8/10. PHYSICAL OCEANOGRAPHY

AD-621 687 Div. 2/9
CFSTI Prices: HC $3.00 MF $0.75
TEXAS A AND M UNIV COLLEGE STATION DEPT OF OCEANOGRAPHY AND METEOROLOGY
SKIN TEMPERATURE OF THE SEA AS DETERMINED BY RADIOMETER.
Technical rept.,
by Robert D. Boudreau. May 65, 79p. Rept. no. reference 65-15T
Contract Nonr211904 Proj. 286
Unclassified report

Descriptors: (*Mediterranean Sea, Temperature), (*Surface temperatures, Mediterranean Sea), Radiometers, Marine meteorology, Heat

transfer, Vapor pressure, Thermal radiation, Rainfall, Oceanographic equipment

Thermal radiation from the sea is emitted from a skin of 0.1-mm thickness. Ninety-five measurements of emission from the sea were made in the American Mediterranean during the summer of 1962, and skin temperatures were obtained. A cool skin was observed in 89 of the cases. Fifteen observations, made in coastal waters, exhibit cooler skins with anomolous characteristics when compared with the skins over deep water. The average value of skinminus-bucket temperature for coastal data is -1.6C; the value for deep-water data in -0.6C. Observations made over waters known to have been traversed by rain showers show a much cooler skin than had been observed prior to the occurrence of rain. Due to the existence of the cool skin, computations of air-sea energy fluxes based on bucket temperatures are inherently erroneous. For data considered, the average error in such computations of latent heat flux is 13 per cent. Furthermore, sensible heat flux computations for average conditions are of the wrong sign; i.e., the sea was receiving heat from the atmosphere, not losing it. For deep-water data, the difference in skin-minus-bucket temperature varied from -1.7C to 0.4C. The variation is found to be primarily related to vapor pressure difference between skin and air and to wind speed.

AD-621 785 Div. 2/9
CFSTI Prices: HC $1.00 MF $0.50
TEXAS A AND M UNIV COLLEGE STATION DEPT OF OCEANOGRAPHY AND METEOROLOGY
A PRELIMINARY PROGRAM OF DIRECT CURRENT MEASUREMENTS OVER THE NORTHEASTERN SHELF OF THE GULF OF MEXICO,
by W. D. Nowlin,Jr., D. L. Durham, and R. O. Reid. 14 Sep 65, 22p. Rept. no. reference 65-25T
Contract Nonr211904 Proj. 286
Unclassified report

Descriptors: (*Ocean currents, Measurement), (*Marine geophysics, Gulf stream), Oceanographic data, Salinity, Temperature

The stated objectives of this program are: (1) To attempt to determine what fraction of the temporal variations of temperature and salinity is due to advection and what fraction is due to internal wave action for the region concerned; (b) To obtain at least a sample description of the tidal and non-tidal flow along the edge of the continental shelf, in order to provide boundary input information for the near shore circulation studies in that area.

AD-621 982 Div. 2/9 ,25/1 ,6/1
CFSTI Prices: HC $3.00 MF $0.75
NAVY ELECTRONICS LAB SAN DIEGO CALIF
INTERNAL WAVES IN THE SEA.
Research and Development rept. for Jun 63-Jun 64,
by O. S. Lee. 26 Jul 65, 61p. Rept. no. 1302
Proj. SR004 03 01 Task 0580
Unclassified report

Descriptors: (*Ocean waves, Reviews), (*Underwater sound, Ocean waves), Propagation, Bibliographies

Internal waves exist in the ocean as a rule rather than an exception. Energy is transported by them in channels that are similar to sound channels. Their effect on naval exercises and equipment, particularly functions involving the use of underwater sound, can be expected to be more pronounced in these channels. Although theory and observation are still not adequate for a full understanding of the phenomenon, western literature prior to June 1963 contains more than 300 publications dealing with internal waves in the atmosphere, lakes, and seas. These publications are listed in the comprehensive bibliography which is part of this report. (Author)

AD-621 993 Div. 2/9 ,2/6 ,30/3
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
RELIABILITY AT SEA OF GIMBAL-SUSPENDED GRAVITY METERS WITH 0.7 CRITICALLY DAMPED ACCELEROMETERS.
Revised ed.,
by Peter Dehlinger. 14 Sep 64, 13p. Contract Nonr128609 ,Nonr21194
Unclassified report

Pub. in Journal of Geophysical Research v69 n24 p5383-94 Dec 15 1964. (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 3 Aug 64.

Descriptors: (*Marine geophysics, Gravity), (*Gravity, Measurement), Ships, Instrumentation, Gimbals, Suspension devices, Meters, Accelerometers, Pacific Ocean, Mexico Gulf

Since the spring of 1962, various reliability determinations have been made at sea with gimbal-suspended LaCoste and Romberg gravity meter S-9 with its accelerometers approximately 0.7 critically damped. Measurements used for determining the meter reliability were obtained in special tests past an offshore platform where gravity was known, over a gravity range, from comparisons with previous pendulum measurements obtained in a submarine, and from intersections of gravity lines obtained on different surveys. The measurements were made in the Gulf of Mexico and in the Pacific Ocean on four different ships, ranging in size from 150 to 3000 tons. Measurements were found to be reliable when the meter beam recordings were straight and continuous, and unreliable when the beam recordings were nonlinear and oscillatory. When both horizontal and vertical accelerations are fairly uniform or nearly sinusoidal, beam recordings are linear and the measurements are reliable. When either the horizontal or vertical accelerations are impulsive or nonsinusoidal, beam recordings are oscillatory and measurements are in error, usually by +15 or more miligals. The controlling factor in reliability of measurements is magnitude and uniformity of the accelerations, not ship size (within broad limits) or straightness of steering. (Author)

AD-621 996 Div. 2/9 ,2/6
OREGON STATE UNIV CORVALLIS
FREE-AIR GRAVITY ANOMALY MAP OF THE GULF OF MEXICO AND ITS TECTONIC IMPLICATIONS, 1963 EDITION,
by Peter Dehlinger, and B. R. Jones. 20 Nov 63, 11p. Contract Nonr128602
Unclassified report

Pub. in Geophysics v30 n1 p102-10 Feb 1965 (Copies not available to DDC or Clearinghouse customers). Prepared for presentation at Annual International Meeting of SEG (33rd), 22 Oct 63, New Orleans. Prepared in cooperation with Texas A and M Univ., College Station, Contract Nonr211904.

Descriptors: (*Isostatic change, Mexico Gulf), (*Gravity, Mexico Gulf), (*Marine geophysics, Gravity), Oceanographic vessels, Hydrographic surveying, Oceanographic data, Ocean bottom topography, Maps

As part of a continuing program, Texas A. and M. University has been making a surface-ship gravity survey of the Gulf of Mexico. The 1963 free-air anomaly map of the Gulf is the second in a series of maps resulting from these investigations; it includes not only a larger area than the first map, but also measurements having considerably higher accuracies. The present map indicates, as the first one suggested, that the Gulf of Mexico is essentially in isostatic equilibrium but contains local mass anomalies. Two cross sections of crustal layers were constructed which are consistent with the gravity observations and published seismic-refraction results. One section extends from Galveston, Texas, to the Yucatan Peninsula, and the other from the Sigsbee Deep to Florida. Both sections consist of four to six layers, in which layer densities were assumed to be uniform laterally and the density below the Mohorovicic discontinuity constant. Densities of the layers were converted from seismic velocities using the Drake and Nafe curves. A free-air anomaly profile across the Cayman Trench is included. (Author)

AD-622 224 Div. 2/9
CFSTI Prices: HC $3.00 MF $0.75
GEOPHYSICAL SCIENCES LAB NEW YORK UNIV N Y
THE APPLICATION OF A PERTURBATION TECHNIQUE TO THE NONLINEAR EQUATIONS OF INTERNAL WAVE MOTION AND A COMPARISON OF THE RESULTANT THEORETICAL WAVE FORMS WITH THOSE OBSERVED IN NATURE.
Technical rept.,
by Clement A. Griscom. Sep 65, 66p. Rept. no. 65-8
Contract Nonr28557
Unclassified report

Descriptors: (*Perturbation theory, Fluid mechanics), (*Water waves, Harmonic analysis), Theory, Twodimensional flow, Oceanographic data, Numerical analysis

A short history is given of the past and current work on internal waves. Time histories demonstrating the effect of thermocline depth on internal wave configuration in shallow water are discussed. Other records on internal wave configurations in deep water are discussed also. A simplified two-layer model is constructed, and a perturbation expansion is carried out for the basic nonlinear equations governing wave motion at the interface of the fluids in order to get the second order correction to the equation for the internal wave profile. Second order profiles are discussed which depend on simplifying assumptions concerning layer depths, density differences, and wavelengths. Also second order profiles are constructed for the shallow water examples which show good agreement with the data presented. These latter profiles are based on numerical analyses of the second order terms. (Author)

AD-622 259 Div. 2/9
CFSTI Prices: HC $4.00 MF $0.75
ARMY AIR FORCES WASHINGTON D C DIRECTORATE OF WEATHER
THE ENGLISH CHANNEL. PART I: OCEANOGRAPHY, VOL. IV, NO. 2.
Nov 42, 109p.
TT , 65-64134
Unclassified report

Includes information compiled from 3 French sources and 1 German source.

Descriptors: (*English Channel, Oceanology), (*Oceanology, English Channel), Oceanographic data, Surface temperatures, Ocean currents, Marine meteorology, Tides, Atlantic Ocean, Salinity, Wind

The English Channel, which is called La Manche by the French, lies between the south coast of England and the north coast of France. Its long axis extends about 300 miles from east-northeast to west-southwest. It is located between 49 deg and 51 deg N. and 1 deg 30' E. and 5 deg W. The Channel may be likened in shape to a funnel, with its open western end presented to the Atlantic Ocean and its narrow eastern spout opening into the North Sea. It is the chief connection between the North Atlantic and the North Sea, and its principal oceanographic characteristics are derived from its position between these bodies of water. The yearly means of both the surface temperature and salinity show a gradient from the relatively high values of the North Atlantic to the lower ones of the North Sea. The movements of both the Atlantic and North Sea water, as well as the action of

the tide, which produces forces which act directly upon the Channel water, bring about the complex current and tidal system. These complex and often swift currents, when opposed by strong winds, produce the characteristic choppy seas of the Channel.

AD-622 260 Div. 2/9
CFSTI Prices: HC $3.00 MF $0.75
ARMY AIR FORCES WASHINGTON D C DIRECTORATE OF WEATHER
TEMPERATURE OF THE SURFACE WATERS OF THE ATLANTIC OCEAN, VOL. VI, NO. 1.
Mar 43, 86p.
TT , 65-64135
Unclassified report

Trans. and adapted from mono. die Temperatur, Berlin, 1938.

Descriptors: (*Atlantic Ocean, Surface temperatures), (*Surface temperatures, Atlantic Ocean), Oceanology, Ocean currents, Oceanographic data, Maps

AD-622 263 Div. 2/9 ,2/5
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
THE MOLOKAI FRACTURE ZONE,
by Stuart M. Smith, and H. W. Menard. 3 Sep 65, 14p. Contract Nonr221623 Grant ,NSF G22629 Proj. NR083 005
Unclassified report

Pub. in Progress in Oceanography v3 p333-45 1965 (Copies available only to DDC users).

Descriptors: (*Marine geology, Pacific Ocean), (*Structural geology, Pacific Ocean), Ocean bottom topography, Faults (Geology)

The Molokai fracture zone lies between Molokai Island, Hawaii and Baja California. It is midway between, and parallel to, the Murray and Clarion zones. Offset of depth contours and the change of parallel ridges and troughs to en echelon structures at 135 W suggest left lateral movement decreasing to the east. The continental extension of the Molokai zone marks the southern limit of the Continental Borderland physiographic province and coincides with a change of topography and crustal structure in the Gulf of California. The Molokai zone appears to be in an intermediate stage of development compared with the adjacent ones. (Author)

AD-622 264 Div. 2/9
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
DEPTH PATTERNS OF BENTHONIC FORAMINIFERA IN THE EASTERN PACIFIC,
by Fred B. Phleger. 7 Sep 65, 16p. Contract Nonr221623 Proj. NR083 005
Unclassified report

Pub. in Progress in Oceanography v3 p273-87 1965 (Copies available only to DDC users).

Descriptors: (*Marine biology, Pacific Ocean), (*Foraminifera, Pacific Ocean), (*Ecology, Marine biology), Aquatic animals, Distribution, Oceans

Depth zonations of benthonic Foraminifera off the western United States are summarized. Generalized depth biofacies in 55 new samples from coastal Mexico are at 25 m, 35 m, 55 m, 75-85 m, 120 m, 180 m, 340 m and 550 m. Criteria for determining depth biofacies are examined. Distributions based on living specimens are the most reliable. Shallow limits of species are the best boundary indicators; deep limits of species vary in value as indicators due to possible movement of specimens downslope. Each species seems to have a distinctive depth range and there are almost as many depth boundaries as there are species. Analysis of species depth ranges in new samples from coastal Mexico shows at least 24 depth boundaries. Analysis of data from the San Diego, California, area suggests 72 boundaries which can be recognized on the basis of shallow and deep limits of species. (Author)

8/11. SEISMOLOGY

AD-621 697 Div. 2/10
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
METHODS OF DETAILED STUDY OF SEISMICITY: FORWORD, INTRODUCTION, CHAP. 1 (METODY DETALNOGO IZUCHENIYA SEISMICHNOSTI).
Rept. on the Energy of Earthquakes,
by I. L. Nersesov, and Yu V. Riznichenko. 13 Feb 62, 22p. Rept. no. ATD-62-23
TT , 62-23704
Unclassified report

Trans. of Akademiya Nauk SSSR. Institut Fiziki Zemli. Trudy, n9 (176) p1-18 1960.

Descriptors: (*Earthquakes, Energy), (*Seismology, Earthquakes), Earth, Seismic waves, Seismological stations, Geology, Earthquake warning systems, USSR

The report describes the seismic apparatus used for detailed investigations. It describes new methods for the large-scale determination of the coordinates of earthquake foci worked out on the basis of experience in seismic exploration and detailed methods for the determination of the structure of the earth's crust on the basis of earthquake observations by a network of stations. Some results of these determinations are given. Methods are described for determination of seismic energy which allow for the extremely substantial influence of dissipation and absorption of energy, especially important in the epicentral zone. An analysis is given of the dependence of the dominant frequencies of oscillations during earthquakes on the dominant frequencies of oscillations during earthquakes on the seismic energy of the focus. Frequency selection apparatus is described and some of the results derived by its use are presented. The results of determination of the dynamic parameters of earthquake foci in the Garmskiy region are given with the statistical processing of the data derived. Estimates and computations are given for the parameters of earthquakes foci and displacements in foci as functions of earthquake energy.

AD-621 715 Div. 2/10
CFSTI Prices: HC $3.00 MF $0.75
SAINT LOUIS UNIV MO
THE TRANSFER FUNCTION FOR P-WAVES FOR A SYSTEM CONSISTING OF A POINT SOURCE IN A LAYERED MEDIUM.
Scientific rept.,
by Kark Fuchs. Jul 65, 66p. Rept. no. SR-12
Contract AF19 604 7399 Proj. 8652 ,ARPA Order 292 Task 865201
AFCRL , 65-526
Unclassified report

Descriptors: (*Functions, Seismic waves), (*Seismic waves, Functions), Earth models, Seismology, Explosions, Geology, Numerical analysis

This paper investigates in what manner the spectrum of body waves radiating from point sources in a multilayered medium over a homogeneous half-space is different from the spectrum of body waves from the same source in an infinite medium. The effect of the system consisting of a point source in a layered crust on the spectrum of p-waves observed at large distances in the half space is studied. Analytical expressions for the transfer unction of this system are derived for three types of point sources: an explosive source, a single couple, and a double couple of arbitrary orientation within the crust. Preliminary numerical computations for the explosive source at various depths in a realistic model of the earth's crust study of the effect of: (a) the angle of incidence into the homogeneous half-space, (b) the source depth, (c) minor variations of the crustal model. In the case of an explosive source the most influential parameter of the transfer function is the source depth. In shallow explosions the low frequency part of the spectrum of body waves is comparatively rejected. (Author)

AD-621 717 Div. 2/10
CFSTI Prices: HC $1.00 MF $0.50
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
OREGON STATE UNIVERSITY SEISMOLOGICAL BULLETIN NO. 6, OCTOBER 1 TO DECEMBER 31, 1964.
Data rept.,
by J. N. Gallagher, and Peter Dehlinger. Aug 65, 10p. Rept. no. DR-20 ,Ref-65-18
Contract Nonr128610 ,AF19 628 2778 Proj. NR083 102
Unclassified report

Descriptors: (*Seismology, Periodicals), Seismological stations, Oregon, Universities, Seismographs, Seismic waves, Earthquakes, Tables, Geophysics

The report includes seismic data recorded at the Corvallis, Klamath Falls, and Portland, Oregon, seismic stations from October 1 to December 31, 1964. (Author)

AD-621 761 Div. 2/10
CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB
SURFACE WAVE RADIATION PATTERN AND SOURCE MECHANISM OF THE SEPTEMBER 1, 1962, IRAN EARTHQUAKE,
by Francis T. Wu, and Ari Ben-Menahem. 12 May 65, 7p. Contract AF49 638 1337
Unclassified report

Pub. in Journal of Geophysical Research v70 n16 p3943-49 Aug 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Seismic waves, Fourier analysis), Earthquakes, Shock waves, Faults (Geology), Iran

Surface waves recorded at stations surrounding the Iran earthquake of September 1, 1962, were Fourieranalyzed; the amplitudes were corrected for instrumental response, geometric spreading, and absorption and are presented as a function of azimuth and frequency. The patterns thus derived are compared with theoretical radiation patterns for different source types, orientation of motion vectors, and other parameters. It is found that the source of the Iran earthquake can be represented as a double couple equivalent to a sinistral reverse shear fault with strike N 80 degrees W, dip 78 degrees to the southwest, slip angle 63 degrees and a depth of 11 km. This solution agrees well with the conclusion obtained from a first motion study. It is remarkable that solutions obtained over such a wide frequency range conform to each other. (Author)

AD-621 887 Div. 2/10
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
GENERAL-PURPOSE SEISMOGRAPHS. DESCRIPTION AND OPERATING INSTRUCTION.
29 May 62, 35p. Rept. no. AID-62-71
TT , 65-64079
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Seismographs, Laboratory equipment), Seismological stations, Design,

Wiring diagrams, Mechanical drawings; Mathematical analysis, USSR

AD-621 953 Div. 2/10 ,20/2
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
PRIMARY GROUND DISPLACEMENTS AND SEISMIC ENERGY NEAR THE GNOME EXPLOSION,
by Joseph W. Berg,Jr., Lynn D. Trembly, and Philip R. Laun. 28 Feb 64, 12p.
Unclassified report

Pub. in Bulletin of the Seismological Society of America v54 n4 p1115-26 Aug 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Seismic wave, Nuclear explosions), (*Nuclear explosions, Soil mechanics), Energy, Measurement, Integral transforms, Seismographs

Near-source measurements of seismic wave from GNOME have been compared with a theoretical seismic source model derived by Blake (1952). It is estimated that 75 percent of the seismic energy in the primary waves is contained in the first half cycle of the ground displacement as shown on the seismograms from instruments located between 0.3 and 10 km from the explosion. The geometrical attenuation of the radiation field of the displacement wave is probably closely approximated by spherical divergence at ranges near the explosion. There is some evidence that a long-period displacement field may exist near the explosion as predicted by the theoretical model. However, there are not sufficient empirical data from the GNOME explosion to make a detailed comparison between theory and observations. (Author)

AD-622 030 Div. 2/10
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
LOCAL TRAVEL-TIME CURVES AND THEIR GEOLOGIC IMPLICATIONS FOR THE PACIFIC NORTHWEST STATES,
by Peter Dehlinger, E. F. Chiburis, and M. M. Collver. 18 Jan 65, 22p. Contract AF19 628 2778 ,Nonr128609 Proj. NR083 600
Unclassified report

Pub. in Bulletin of the Seismological Society of America v55 n3 p587-607 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Seismology, Structural geology), (*Seismic waves, Propagation), (*Earthquakes, Seismic waves), Velocity, Graphics, Seismological stations, Geophysics

Travel-time curves were constructed for the Pacific Northwest states based on recordings of recent local earthquakes. The travel-time curves show that velocities of P sub n and S sub n waves are significantly different in the provinces east and west of the Cascade Mountains, while the corresponding crustal velocities are essentially the same. The crustal section west of the Cascades is thinner, on an average, by 5 to 10 km than that to the east. P sub n and S sub n velocities are 4 per cent lower in the west, although Poisson's ratio is 0.26 in both mantle sections. The mantle sections above the low-velocity layer appear to be of uniform composition in each province; the corresponding section in the east appears to be typical or normal while that in the west appears to consist of a different material or of a different mineralogical composition, presumably having a lower density as well as a lower velocity of propagation. The velocity differences in the two mantle sections are not believed to be caused only by differences in regional crystal alignments or by differences in temperatures. (Author)

AD-621 721 See Fld. 8/6

8/14. TERRESTRIAL MAGNETISM

AD-621 880 Div. 2/6 ,30/4
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
NEAR-SHORE MARINE GRAVITY RANGE, NEWPORT, OREGON,
by Wilbur A. Rinehart, and Joseph W. Berg,Jr..
26 Jan 63, 4p. Contract Nonr 128610 Grant, NSF G24353 Proj. NR083 102
Unclassified report

Pub. in Journal of Geophysical Research v68 n19 1 Oct 63 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gravity, Marine geophysics), (*Ranges (Establishments), Marine geophysics), (*Marine geophysics, Ranges (Establishments)), Ships, Instrumentation, Calibration, Pacific Ocean, Seacoast, Oregon

Anticipating the use of surface-ship gravity meters off the west coast of the United States by marine geophysicists, the Geophysics Research Group of the Department of Oceanography, Oregon State University, established a near-shore marine gravity range along the north-central Oregon coast. The primary purpose of the survey was to establish a calibration range for a surface-ship gravity meter.

AD-621 964 Div. 2/6
IOWA UNIV IOWA CITY DEPT OF PHYSICS AND ASTRONOMY
ISOCONTOURS OF MAGNETIC SHELL PARAMETERS B AND L,
by Bharathi Venkatesan. 19 Apr 65, 10p. Contract Nonr150906 ,N9onr93803
Unclassified report

Pub. in Journal of Geophysical Research v70 n15 p3771-80 Aug 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Terrestrial magnetism, Field theory), Magnetic fields, Maps, Integrals, Invariance

Isocontours are given of L and B at an altitude of 1,000 km. Variation of altitudes of constant B with longitude are given for northern and southern hemispheres where L=3.50, 2.20, 1.60, 1.20, and 1.12. B = the scalar magnetic field, I = the integral invariant, and L = f (B, I).

AD-621 965 Div. 2/6
IOWA UNIV IOWA CITY DEPT OF PHYSICS AND ASTRONOMY
INWARD RADIAL DIFFUSION OF ELECTRONS OF GREATER THAN 1.6 MILLION ELECTRON VOLTS IN THE OUTER RADIATION ZONE,
by L. A. Frank. 3 May 65, 8p. Contract Nonr150906 Grant ,NsG233 62
Unclassified report

Pub. in Journal of Geophysical Research v70 n15 p3533-40 Aug 1 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrons, Diffusion), (*Van Allen radiation belt, Electrons), Terrestrial magnetism, Electron density, Intensity, Upper atmosphere

Observations of the temporal variations of electron (E > 1.6 Mev) intensities near the geomagnetic equator in the outer radiation zone with Explorer 14 (October 2, 1962, to August 8, 1963) strongly suggest that replenishment of energetic electrons in the outer radiation zone during the several weeks following a period of geomagnetic activity proceeds by an inward radial motion of energetic electrons from L > 5. The apparent, inward radial velocity of the 'wave' of electrons (E > 1.6 Mev) is approximately 0.4 earth radius/ (day) at L = 4.7 and approximately 0.03 earth radius/ (day) at L = 3.4, and varies as approximately L to the 8th power between these L shells. These inward radial velocities for the several replenishment cycles of outer-zone electrons (E > 1.6 Mev) observed with Explorer 14 at a given L shell are equal to within experimental errors. These measurements provide evidence for a continually active mechanism for diffusing energetic electrons across L shells in the outer radiation zone. (Author)

AD-622 228 Div. 2/6 ,2/5
CFSTI Prices: HC $2.00 MF $0.50
NAVY UNDERWATER SOUND LAB NEW LONDON CONN
SOME NOTES ON THE UTILIZATION OF A VERTICAL MAGNETIC DIPOLE TO DETERMINE THE PROPERTIES OF A STRATIFIED EARTH.
Research rept.,
by Peter R. Bannister. 5 Oct 65, 38p. Rept. no. USL-695
Proj. SF106 01 02 10215
Unclassified report

Descriptors: (*Earth, Electrical properties), (*Geophysical prospecting, Stratigraphy), (*Stratigraphy, Geophysical prospecting), (*Dipole antennas, Geophysical prospecting), Magnetic moments, Dipole moments, Terrestrial magnetism, Earth models, Mathematical models

The fields of a vertical magnetic dipole (VMD) located over a stratified earth are derived for the quasi-static range (absolute value gamma sub o rho << 1) and z = h = 0. It is demonstrated that the VMD method may be used in connection with the dipole-dipole method in order to resolve the electrical properties of a simple three-layer model earth (rho sub 1 << rho sub 2 >> rho sub 3). (Author)

AD-621 660 See Fld. 5/6

AD-621 993 See Fld. 8/10

AD-621 996 See Fld. 8/10

AD-622 120 See Fld. 20/4

AD-622 222 See Fld. 20/3

AD-622 223 See Fld. 20/3

9/1. COMPONENTS

AD-621 683 Div. 8/4 ,25/4
CFSTI Prices: HC $3.00 MF $0.75
WESTINGHOUSE ELECTRIC CORP ELMIRA N Y ELECTRONIC TUBE DIV
NON-BLOOMING IMAGE ORTHICON.
Rept. no. 6 (final), 1 Jul 63-31 Jan 65,
by J. Mueller. 31 Jan 65, 72p. Contract DA36 039AMC03249E Proj. DA1P6 22001A055 Task DA1P6 22001A055 03
Unclassified report

Descriptors: (*Image orthicons, Electron optics), (*Electron optics, Image orthicons), Resolution, Camera tubes, Optical properties, Electron tube targets, Films, Photocathodes, Alkali metals, Television equipment

A development program is presented for an image orthicon with a thin-film target and a trialkali photocathode, with the capability of handling very high spot-illuminations in scenes of low general illumination. The 'Non-Blooming Image Orthi-

cons' developed had the standard electroformed target-mesh replaced by a thick collector-mesh and a fieldmesh spaced 1 mm from the target. Major problems encountered that limited the investigation were target breakage and non-uniform electron penetration through the collector-mesh. Blooming measurements were performed with a special test-chart. Tubes were made that demonstrated only 1% loss in video information with spot-illumination at the photo-cathode at the 0.00001 foot-candle level. These figures are applicable only to measurements made with this test-chart, and substantially lower ratios are to be expected with real or simulated scenes of less than 100% contrast and bright spots of larger relative area. The best non-blooming characteristics were observed on thick-collector-mesh image orthicons with an integral target-field-mesh.

AD-621 692 Div. 8/4 ,8/6
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
HIGH-POWER ELECTRONICS: HIGHLIGHTS OF WORK BY P. L. KAPITSA.
13 Mar 63, 19p. Rept. no. ATD-S-63-33
TT , 65-64028
Unclassified report

Descriptors: (*Magnetrons, Theory), Radiofrequency power, Wave transmission, Frequency converters, Particle accelerators, Waveguide filters, Superhigh frequency, Waveguides, Resonators, Microwave oscillators, Reviews, Scientific personnel, USSR

The basic purpose of the developments outlined in Kapitsa's work is the refinement of the magnetron theory and its application to the design of versatile superpower electron devices suitable for generation of shf oscillations and long-distance transmission of energy through waveguides and through directional beams in free space. These devices, called 'planotrons,' can also be used as superpower d-c/a-c and a-c/d-c converters, particle accelerators, frequency converters, and selective waveguide filters. (Author)

AD-621 727 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH INTO NEW APPROACHES FOR VHF FILTER CRYSTALS.
Quarterly rept. no. 8, 16 Apr-15 Jul 65,
by D. J. Koneval, and D. R. Curran. 18 Aug 65, 26p. Contract DA36 039AMC02245E Proj. 1P6 22001A058,303180
Unclassified report

See also AD-617 187.

Descriptors: (*Quartz resonators, Crystal filters), (*Crystal filters, Very high frequency), Dielectric films, Harmonic oscillators, Electrodes, Quartz, Silicon compounds, Monoxides, Surface properties, Tuning devices

Experiments in which resonator Q sub m is observed as a function of electrode length were continued in an attempt to correlate these data with the theoretical results obtained by Professor R. D. Mindlin from a consideration of intermode coupling. Results to data have been inconclusive. Initial attempts to fabricate 90 Mc, 5th harmonic mode inverted mesa resonators using deposited films indicated that substantial improvement in techniques for alignment between resonator electrodes and the deposited dielectric layer would be required. A non-optical method of determining the parallelism of quartz blanks was investigated. Air-gap frequency measurements yielded a qualitative measure of the parallelism of quartz blanks. Refinements of this technique should provide a more precise measurement of blanks having a thickness variation of less than half wavelength. (Author)

AD-621 748 Div. 8/2 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
WESTON INSTRUMENTS INC NEWARK NJ
A POROUS SUBSTRATE RESISTOR AIMED AT MINIATURIZATION OF METAL-FILM RESISTORS.
Interim development rept. no. 11, 1 Mar-31 May 65,
by T. Matley, and P. M. Gross. 31 May 65, 16p.
Contract NObsr87542 Proj. SR0080303
Unclassified report

See also AD-619 824.

Descriptors: (*Resistors, Microminiaturization (Electronics)), (*Microminiaturization (Electronics), Resistors), (*Metal films, Resistors), Porous materials, Soldering, Electric terminals, Cylindrical bodies, Epoxy plastics, Packaging

A new method of soldering a terminal onto the porous substrate was attempted with encouraging results. This terminating method allows the metallizing to be performed prior to termination. The advantage is that better solution penetration during metallizing results if the surface of the substrate is not masked by terminals. A new cylindrical shaped substrate was successfully tried as a replacement for the old style. The new substrate measures 0.25' in diameter and 0.40' in length as compared to the old style that measures 0.30' X 0.30' X 0.40'. The new shape substrate is molded of the same material as the old style (Filtros Inc. Type K). (Author)

AD-621 754 Div. 8/4
CFSTI Prices: HC $1.00 MF $0.50
DUMONT ELECTRON TUBES CLIFTON NJ
12 INCH DIAMETER CATHODE RAY TUBE.
Interim development rept. no. 1, 1-31 Jul 65,
by Emil Sanford. 20 Jul 65, 3p: Contract NObsr93316 Proj. SR0080301 Task 9480
Unclassified report

Descriptors: (*Cathode ray tubes, Manufacturing methods), Radar equipment, Display systems, Electron guns, Electron tube parts, Electron beams, Electrostatic fields, Focusing, Phosphoresent materials, Magnesium compounds, Flourides, Manganese, Design, Tests

The purpose of this research is to develop a 12 inch round cathode ray tube with electrostatic deflection and focus, capable of presenting radar data with symbology at high speed for applications in tactical data processing systems and modular display.

AD-621 755 Div. 8/4
CFSTI Prices: HC $1.00 MF $0.50
DUMONT ELECTRON TUBES CLIFTON NJ
12 DIAMETER CATHODE RAY TUBE.
Interim development rept. no. 2, 2-31 Aug 65,
by Emil Sanford. 2 Sep 65, 5p. Contract Nobsr93316 Proj. SR0080301 Task 9480
Unclassified report

See also AD-621 754.

Descriptors: (*Cathode ray tubes, Manufacturing methods), Radar equipment, Display systems, Electron guns, Electron tube parts, Electron beams, Electrostatic fields, Focusing, Phosphorescent materials, Magnesium compounds, Flourides, Manganese, Design, Tests

Two experimental tubes are being fabricated. The first assembly is expected to define the operating characteristics of a virtual cathode ahead of a focussing beam control element. The second assembly will test the sensitivity of a large area curved cathode for beam current modulation. High modulation sensitivity means a large figure of transconductance. In turn this directly implies a large area of cathode emission is directly controlled as an electron beam of usable cross-section and exit angle. Otherwise a useful phosphor screen spot size is not attained. Phosphors that are being investigated now are in the magnesium flouride, manganese activated category. These are characterized as long persistance types with an orange phosphorescence.

AD-621 762 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
WESTON INSTRUMENTS INC NEWARK NJ
A POROUS SUBSTRATE RESISTOR AIMED AT MINIATURIZATION OF METAL-FILM RESISTORS.
Interim development rept. no. 12, 1 Jun-31 Aug 65,
by T. Matley, and P. M. Gross. 31 Aug 65, 25p.
Contract NObsr 87542 Proj. SR0080303 Task 9636
Unclassified report

See also AD-621 748.

Descriptors: (*Resistors, Microminiaturization (Electronics)), (*Microminiaturization (Electronics), Resistors), (*Metal films, Resistors), Porous materials, Electric terminals, Brazing, Epoxy plastics, Penetration, Vapor plating, Vacuum apparatus, Resistance (Electrical), Metal coatings

A ratio parameter has been defined as the length resistance divided by the width resistance. This parameter clearly provides enough information to evaluate terminals when substrate quality and metallizing are controlled. Additional information regarding terminal quality is provided by the % standard deviation in resistance under similar circumstances. Various types of brazed terminals have been evaluated accordingly. It has been determined that a high quality type of brazed terminal still prevents satisfactory metallization. A terminal which can be supplied after heat treatment must be employed and vacuum metallizing may be required in spite of large lot-to-lot variations in resistance. (Author)

AD-621 821 Div. 8/4 ,8/6
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
COMMENT ON HIGH-POWER ELECTRONICS BY P. L. KAPITSA.
14 Mar 63, 5p. Rept. no. AID-S-63-35
TT , 65-64070
Unclassified report

Supplement to AID-S-63-33. AD-621 692.

Descriptors: (*Magnetrons, Theory), Microwave equipment, USSR

AD-621 846 Div. 8/2 ,25/6
CFSTI Prices: HC $4.00 MF $1.00
GENERAL TELEPHONE AND ELECTRONICS LABS INC BAYSIDE N Y
NONLINEAR SEMICONDUCTORS AT MILLIMETER FREQUENCIES.
Final rept. for 1 Jun 63-30 May 65,
by R. I. Harrison, E. M. Conwell, F. Drago, D. Eleri, and J. Zucker. Aug 65, 144p. Rept. no. TR-65-102.8
Contract DA36 039AMC02300E Proj. DA1P6 22001A056 Task 1P6 22001A056 01
ECOM , TR-02300-F
Unclassified report

Descriptors: (*Semiconductors, Thermoelectricity), (*Semiconductor devices, Millimeter waves), Demodulators, Modulators, Amplitude modulation, Waveform generators, Harmonic oscillators, Mixers (Electronic), Indium alloys, Antimony alloys, Cryogenics, Performance (Engineering), Extremely high frequency

A research program was conducted in which the effects of heated carriers in semiconductors were investigated and employed the design and development of novel millimeterwave devices. The devices included a video detector, heterodyne mixer, amplitude modulator, and harmonic generator, designed for operation in the 50 to 90 Gc/s range. The experimental models were designed and constructed for operation at room temperature with the exception of the InSb mixer for which significantly improved performance was achieved by cooling to liquid nitrogen temperature. The theoretical and experimental investigations of the 'thermoelectric effect' of hot carriers in a semiconductor are described. The analysis, design, and development of the experimental hot-carrier devices are presented. (Author)

AD-621 856 Div. 8/2 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
WESTINGHOUSE ELECTRIC CORP PHILADELPHIA PA
PRODUCTION ENGINEERING MEASURE. TYPE 2N2762 SILICON ALLOY TRANSISTOR.
Quarterly progress rept. no. 8, 1 Apr-30 Jun 65,
by R. J. Pisarcik, and J. E. Priest. 30 Jun 65, 15p.
Contract DA36 039AMC03617E
Unclassified report

See also AD-617 736.

Descriptors: (*Transistors, Manufacturing methods), Silicon, Reliability (Electronics), Life expectancy, Processing

All process improvements are noted as completed and incorporated in the contract device. The status and yield data are presented for the production run. Additional data are presented for the step stress program for the reliability test program. A modification, to provide more accurate control of starting material, is described for the evaluation of silicon wafers. (Author)

AD-621 872 Div. 8/2 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
ADVANCED TECHNOLOGY CORP TIMONIUM MD
HIGH POWER FERRITE PHASE SHIFTER.
Final technical rept.,
by Frederick L. Wentworth. Oct 65, 87p. Contract AF30 602 3495 Proj. arpa order no. 550
Unclassified report

See also AD-610 467.

Descriptors: (*Phase shifters, Performance (Engineering)), (*Ferromagnetic materials, Phase shifters), Electromagnetic properties, Ferrites, Lithium compounds, Waveguides, Radiofrequency power, Xband, C-band

Theoretical estimates of phase shifter performance as a function of material parameters are presented by examining the results obtained from the small perturbation model used by Button and Lax and from the fully ferrite loaded, parallel plane waveguide model used by Suhl and Walker. The extension of Suhl's theory on nonlinear effects at high power by Fletcher and Silence is applied to relate the material parameters and operating frequency to the magnetic field required to avoid high power subsidiary resonance effects. Experiments designed to demonstrate the relationship of phase shift and loss characteristics to material parameters and configuration for longitudinally magnetized ferrites in rectangular waveguide are described. Polycrystalline ferrites with both cubic and hexagonal structures are examined. Of the hexagonal materials, both uniaxial and planar types with oriented anisotropy fields are discussed. The experimental work leading to the growth of extremely large single crystals of lithium ferrite and their electrical and magnetic properties are reported. Experiments which reduced the linewidth of lithium ferrite samples by heat treatment and polishing are described. High power tests to 100 kw peak are reported for waveguide configurations containing (1) single crystal lithium ferrite; (2) polycrystalline cubic structure, nickel ferrite; and (3) polycrystalline hexagonal structure nickel-cobalt 'W' ferrite with its magnetic anisotropy oriented parallel to the applied magnetic field. These high power tests demonstrate that the nonlinear high power effects can be avoided by operating at magnetic fields above ferrimagnetic resonance as prescribed by Fletcher and Silence. (Author)

AD-621 873 Div. 8/2 ,26/3
CFSTI Prices: HC $3.00 MF $0.75
TEXAS INSTRUMENTS INC DALLAS SEMICONDUCTOR-COMPONENTS DIV
PRODUCTION ENGINEERING MEASURE (PEM) FOR TRANSISTOR, PNP, SILICON, SWITCHING TYPE EL-2N (X-12).
Quarterly progress rept. no. 1, 25 Mar-25 Jun 65,
by Larry Lands. 25 Jun 65, 73p. Rept. no. 03-65-69
Contract DA36 039AMC06160E
Unclassified report

Descriptors: (*Transistors, Manufacturing methods), Silicon, Resistance (Electrical), Semiconducting films, Gold, Diffusion, Epitaxial growth, Impurities, Performance (Engineering), Configuration

The developmental geometry was modified from a stripe emitter to a circle emitter. Device geometry was made smaller and greater versatility was achieved. Initial material resistivity produced adequate breakdowns when epitaxial film thickness exceeded 0.20 mil. However, initial device runs were characterized by high V sub (CE (sat)') low h sub FE and absolute value (h sub fe). The fall off of h sub FE at low voltages and 10 milliamperes collector current was primarily due to the high V sub (CE (sat)). Plots of h sub FE and absolute value (h sub fe) vs. collector current indicated the peak point of operation was approximately one milliampere. Switching times reflected these problems in long rise and fall times. The parasitic capacitances of the device package and the switching jig prevented a delay time of three nanoseconds. Gold diffusion was successful in attaining storage times below nine nanoseconds. Leakage currents were not appreciably affected by gold diffusion. (Author)

AD-621 891 Div. 8/2 ,26/3
CFSTI Prices: HC $4.00 MF $1.00
WESTON INSTRUMENTS INC ARCHBALD PA
PRODUCTION FACILITIES FOR MULTI-TURN METALFILM TRIMMER RESISTORS PER SIGNAL CORPS TECHNICAL REQUIREMENTS SCS-127 AND MIL-R22097B (MODIFIED).
Quarterly progress rept. no. 11, 1 Jan-31 Mar 65.
31 Mar 65, 138p. Contract DA36 039sc86734
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale. See also AD-613 029.

Descriptors: (*Variable resistors, Manufacturing methods), Metal films, Resistance (Electrical), Failure (Mechanics), Life expectancy, Potentiometers, Performance (Engineering)

Qualification testing of thirty five (35) each of the 200 ohms, 1K ohms, 25K ohms, 50K ohms and 200K ohms potentiometers is complete. The results indicate a number of problem areas with the primary one being the resistive film itself. Efforts to produce the thirty five 50 ohms potentiometers have been discontinued until a more reliable resistive film can be produced. The toroid contact spring with a round cross section has been evaluated. Excessive wear resulted in some cases. This is felt to be a film problem. Leaking of the potentiometer during the immersion test was found to result from insufficient thickness of the head gasket. Steps are being taken to correct the problem. The production glazing area has been set up and production runs made with very satisfactory results. It has been found that different methods of termination lead to variations of results obtained when the film is applied in an otherwise identical manner. This phenomenon is being studied first with the intention of learning more about the fundamentals which affect the film and second to determine which is the optimum termination method.

AD-621 896 Div. 8/2 ,25/2 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
BULOVA WATCH CO WOODSIDE N Y ELECTRONICS DIV
PRODUCTION ENGINEERING MEASURE FOR TYPE CR- (XM-60)/U CRYSTAL UNITS.
Quarterly rept. no. 4, Apr-Jun 65,
by G. A. LaGasse. Jun 65, 23p. Contract DA36 039AMC03633E
Unclassified report

See also AD-617 912.

Descriptors: (*Crystals, Electronic devices), (*Crystal holders, Manufacturing methods), Low frequency, Copper, Welding, Ultrasonic radiation, Welds, Electric wire, Quartz resonators, Chemical milling, Etched crystals, Processing, Reliability (Electronics), Aluminum, Aging (Materials)

The results of two meetings to discuss the problems involved in obtaining satisfactory Kold-Weld holders of the HC-6/U configuration are detailed: attempts at obtaining satisfactory lead attachment by means of ultrasonic welding techniques are described, as well as results of investigations to improve processing and fabrication techniques and results obtained during the first four months of the reliability study of CR-47A/U crystal units. (Author)

AD-621 904 Div. 8/2
SASKATCHEWAN UNIV SASKATOON DEPT OF ELECTRICAL ENGINEERING
FOUR-TERMINAL FIELD-EFFECT TRANSISTORS.
Revised ed.,
by R. S. C. Cobbold, and F. N. Trofimenkoff. 19 Feb 65, 2p. Contract DRB5501 32
Unclassified report

Pub. in IEEE Transactions on Electron Devices vED12 n5 p246-7 May 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 22 Sep 64.

Descriptors: (*Transistors, Electrical conductance), Mathematical analysis, Voltage

A derivation is presented for the transconductances of a four-terminal transistor of arbitrary channel doping profile. The derivation takes into account finite barrier potential and is specifically applied to the symmetrical, abrupt-junction, four-terminal, field-effect transistor. Curves are presented showing variations of normalized transconductance with applied gate-source EMF. (Author)

AD-621 925 Div. 8/2 ,8/3
CFSTI Prices: HC $2.00 MF $0.50
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
A TOPOLOGICAL TECHNIQUE FOR ANALYSIS OF ACTIVE NETWORKS,
by John T. Barrows. Aug 65, 38p. Rept. no. R-266
Contract DA28 043AMC00073E Proj. 20014501B31F
Unclassified report

Descriptors: (*Topology, Electrical networks), (*Electrical networks, Topology), Electrical impedance, Admittance, Matrix algebra, Circuits

This paper presents a generalization of Fuessner's method for the analysis of active networks. This method makes it possible to determine system functions of any network in a simple and straightforward manner. In the usual topological analysis of networks it is necessary to list all possible trees or co-trees and the signs of their tree admittance products as well as determining the set of 2-tree products and their signs for the network function in question. Usually two graphs, a current and a voltage graph, are used to implement this process when dependent sources are present in the network. The method presented here utilizes solely the original topology and the assigned branch current directions to determine these terms and their sign. Justification of the technique is given for the cases of one and two dependent sources present in a network with the summary of the method for each case. The analysis of a network with an arbitrary number of dependent sources is seen to follow directly. Finally an example of a network with two dependent sources is given which illustrates the method. (Author)

AD-621 936 Div. 8/2 ,25/6 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C
RESEARCH PROBLEMS OF NEW PHOTOCATHODES,
by E. Kanski. Oct 65, 17p. Contract DA44 009AMC930T Proj. 1P014 501A31B AERDL ,TT-65-64084 T-1802-65;
Unclassified report

Trans. of Experimentelle Technik der Physik (East Germany) v13 n1 1965. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Photocathodes, Synthesis (Chemistry)), (*Cesium alloys, Antimony alloy), Photoelectric effect, Intermetallic compounds, Solid state physics, Semiconductors, Crystal lattices, East Germany

The article emphasizes the necessity for a systematic study of the chemical reactions occurring during the synthesis of cathodes. The synthesis of a Cs3Sb layer is interpreted as a solid-state reaction. A three component system is described, giving the positions of components with a high quantum yield eta for an external photoelectric effect. The great number of compounds which could be used for the development of photocathodes with a high eta is pointed out. Three criteria are proposed for the search for new emission layers. (Author)

AD-621 946 Div. 8/2 ,16/4
LOUISVILLE UNIV KY
THE APPLICATION OF A SYSTEM OF FIXED-ROTATING VECTORS TO CIRCUIT ANALYSIS AND SYNTHESIS,
by Carl T. Case, and Manuel Schwartz. 27 Feb 64, 21p. Contract PHS GM10523 Proj. 4642 Task 464202 AFCRL ,PMSRP 65-598; ,127
Unclassified report

Pub. in the J. Theoretical Biology v8 p221-32 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Circuits, Vector analysis), (*Electrical impedance, Circuits), Synthesis, Dielectrics, Membranes (Biology), Resistance (Electrical), Capacitance, Complex variables

A system of fixed-rotating vectors can be used to study the impedance loci of functions of the first Foster form and of systems including negative impedance converters. Of particular interest in the field of dielectrics and biological membrane studies is parallel RC network, where the dielectric of the capacitor is given by the Debye dispersion relations. Such a network also falls into the category of the first Foster form. (Author)

AD-622 009 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
PUSH-PULL AMPLIFIER DESIGN.
Professional paper,
by John Staudhammer. 23 Aug 65, 23p. Rept. no. SP-2175/000/00
Unclassified report

Descriptors: (*Push-pull amplifiers, Power amplifiers), (*Power amplifiers, Push-pull amplifiers), Design, Circuits

A method is presented that will allow the determination of various parameters in a push-pull connected circuit. The method allows optimization of circuit performance for required output powers. An illustration is included using a prototype audio output stage. (Author)

AD-622 031 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
TEXAS INSTRUMENTS INC DALLAS SEMICONDUCTOR-COMPONENTS DIV
DESIGN, DEVELOPMENT AND DELIVERY OF ONE (1) BREADBOARD AND THREE (3) PRODUCTION UNITS OF A 75 VA INTEGRATED STATIC INVERTER.
Monthly rept. no. 5,
by J. P. Vergez, R. T. Windecker, L. L. Glover, and P. F. Newcomb. Sep 65, 11p. Contract NAS8 11925
Unclassified report

Descriptors: (*Inverters, Semiconductor devices), Transistors, Inverter circuits, Design

Circuit design effort was primarily directed toward simplification of the circuitry required to provide short circuit/overload protection. The electrical characteristics of fabricated power transistors were evaluated. Approximately 75 of the transistors tested met the requirements for the inverter circuit. Assembly of dual transistor assemblies has been delayed by shortage of piece parts, but the processing of material for the silicon-oxide isolated devices is progressing satisfactorily. The flip-flop design has been finalized, and the array layout is in progress. (Author)

AD-622 089 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
STUDY OF CROSSED-FIELD AMPLIFIERS.
Quarterly progress rept. no. 7, 15 Jan-14 Apr 65, by T. Van Duzer, N. R. Mantena, R. Y. C. Ho, R. A. Rao, and A. Sasaki. 15 Apr 65, 18p. Contract DA36 039AMC02164E Proj. 3A99 13 001
Unclassified report

See also AD-617 324.

Descriptors: (*Crossed field devices, Microwave amplifiers), (*Amplifiers, Crossed field devices), Electromagnetic shielding, Electron guns, Electron beams, Backward-wave amplifiers, Noise (Radio), Cathodes (Electron tubes), Magnetrons, Space charges

Shielded-gun crossed-field amplifier; Backward-wave noise-figure studies; Noise-figure studies on forwardwave crossed-field amplifiers; Cathode-region studies on crossed-field tubes; Characteristics of the smoothbore magnetron.

AD-622 094 Div. 8/2 ,25/6 ,26/1
CFSTI Prices: HC $2.00 MF $0.50
SPERRY MICROWAVE ELECTRONICS CO CLEARWATER FLA
PRODUCTION ENGINEERING MEASURE YIG SPHERES AND LIMITERS.
Quarterly progress rept. no. 8, 28 Feb-29 May 65, by J. E. Andrews, and D. E. Tribby. 29 May 65, 27p. Rept. no. SJ-222-0045-8
Contract DA36 039AMC01477E
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ferroelectric crystals, Manufacturing methods), (*Limiters, Manufacturing methods), (*Spheres, Single crystals), (*Single crystals, Crystal growth), Gallium alloys, Yttrium alloys, Intermetallic compounds, Iron alloys, Garnet, L-band, Magnetic fields, Processing, Reliability (Electronics)

A new sphere sizer has been designed and fabricated for use in rapidly grouping spheres according to their diameter. This new tool has been tested and found to enhance the efficiency of the sphere forming operation. The frequency instability problem encountered when subjecting the L band limiters to a varying temperature environment has been solved by careful adjustment of the permanent magnetic field in conjunction with a new sphere alignment technique. The insertion loss problem occuring in some L band limiters has been solved by a method of matching into and out of the Ga YIG coupling element. No single crystal material was fired during this reporting period. (Author)

AD-622 106 Div. 8/2
PRINCETON UNIV N J
A PROPERTY OF LOW-PASS FILTERS.
Revised ed.,
by David R. Brillinger. 20 Jul 64, 3p.
Unclassified report

Pub. in SIAM Review v7 n1 p65-7 Jan 1965 (Copies available only to DDC users.) Revision of manuscript submitted 31 Oct 63.

Descriptors: (*Low-pass filters, Theory), Functions, Operation, Polynomials

AD-622 121 Div. 8/4
MCMASTER UNIV HAMILTON (ONTARIO) DEPT OF ELECTRICAL ENGINEERING
A HIGH VOLTAGE PULSE GENERATOR USING SWITCHED THYRATRONS,
by T. Chan, M. Eng, and M. W. Gunn. 1964, 3p.
Unclassified report

Pub. in Electronic Engineering Jun 1965 (Copies available only to DDC users).

Descriptors: (*Pulse generators, Thyratrons), Voltage, Switching circuits, Trigger circuits, Design

The design of a high voltage pulse generator using hydrogen thyratrons in an on-off switching cycle is described. This design seeks to combine the advantages of 'line type' and 'hard valve' generators by providing an output pulse which can be continuously varied in duration with a low output resistance. The generator described produces well shaped rectangular pulses up to 4kV in magnitude continuously variable in length from 0.2 microsec with a source resistance of approximately 13 ohms. The design can be readily extended to provide output voltages to a maximum of 16kV. (Author)

AD-622 203 Div. 8/2 ,30/3
CFSTI Prices: HC $5.00 MF $1.00
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
PHYSICAL REALIZABILITY AND SENSITIVITY IN THE DESIGN OF MILTIVARIABLE FEEDBACK CONTROL SYSTEMS.
Doctoral thesis,
by Bui Tien Rung. 1964, 180p.
Unclassified report

702-666 O-65-4

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Control systems, Synthesis), Feedback, Sensitivity, Linear systems

Two aspects of multivariable control systems design are investigated: physical realizability and sensitivity. A criterion is developed permitting quick recognition as to whether or not a system can be realized physically. Two sensitivity design methods using root-locus are presented, one applicable to problems with small parameter changes, the other to problems with large parameter changes.

AD-622 204 Div. 8/2 ,30/3
CFSTI Prices: HC $4.00 MF $0.75
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
A DIRECT METHOD OF DESIGNING LINEAR FEEDBACK CONTROL SYSTEMS BY APPLYING MITROVIC'S METHOD.
Master's thesis,
by Chon Ho Hyon. 1964, 118p.
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Control systems, Design), Feedback, Linear systems, Algebra, Numerical methods and procedures

A direct method of designing a linear feedback control system is developed by applying the basic Mitrovic's method. By this method the given system can be compensated so that the roots of the compensated system lie at the specified locations for a specified gain. The possibility of insuring the dominancy of the specified roots can also be checked in the early stage of the design procedure so that the labor and time involved are minimized. The dominancy of the specified roots is observed on the Mitrovic's chart of an order two less than that of the compensated system characteristic equation. Thus the design of a feedback system whose compensated system characteristic equation has an order five or less does not require to draw Mitrovic's curves since a universal second order and a universal third order Mitrovic's charts are already available. In these cases the compensation problem is particularly easy to solve and it requires only to calculate some algebraic equations. (Author)

AD-622 206 Div. 8/2 ,26/3
CFSTI Prices: HC $2.00 MF $0.50
PIEZO CRYSTAL CO CARLISLE PA
PEM QUARTZ CRYSTAL UNITS, FILTER LOW FREQUENCY, 1 MC TO 10 MC TYPES CR- (XM-49)/U THRU CR- (XM-52)/U PER SCS-191.
Quarterly progress rept. no. 4, 1 Apr-30 Jun 65,
by A. S. Matistic. Aug 65, 28p. Contract DA36 039AMC03635E
Unclassified report

See also AD-619 103.

Descriptors: (*Crystal filters, Manufacturing methods), (*Quartz, Crystal filters), High frequency, Medium frequency, Crystal holders, Performance (Engineering)

The report covers the following: fabrication and submission of the 3rd set of engineering samples and details of a mass loading experiment at 5 mc. The 3rd set of engineering samples - 5 crystal units each at frequencies 1.75 mc, 5 mc, 6 mc, 7.5 mc and 10 mc - consisted of a planoconvex design at 1.75 mc and a flat plate design (incorporating mass loading) at the 4 remaining frequencies. Although filter response characteristics were satisfactory for all 5 frequencies, obtained series resistance values and plateback amounts were excessive at frequencies 5 mc, 6 mc and 7.5 mc. The mass loading experiment was performed on 5 mc crystal blanks in an attempt to obtain reduced platebacks (for required unwanted mode suppression) and lower series resistance values. (Author)

AD-622 256 Div. 8/2 ,26/3
CFSTI Prices: HC $5.00 MF $1.00
HAMILTON STANDARD DIV UNITED AIRCRAFT CORP BROAD BROOK CONN
ENHANCED MICRO-MODULE INTERCONNECTIONS. AN HERMETIC PACKAGING SYSTEM FOR THE INTEGRATION OF MICRO CIRCUITS.
Final rept. for 12 Jun 63-15 Mar 65,
by D. J. Garibotti. 15 Mar 65, 166p. Rept. no. HSER-3078
Contract DA36 039AMC03620E
Unclassified report

See also AD-611 284.

Descriptors: (*Integrated circuits, Microminiaturization (Electronics)), (*Package circuits, Integrated circuits), Modules (Electronic), Electron beams, Welding, Hermetic seals, Manufacturing methods

A pilot production capability was established to assembly 100 Enhanced Micro Modules per eight hour shift. The Enhanced Micro Module is an all electron beam welded, hermetically sealed interconnection packaging system which is compatible with all approaches to microminiaturization. The production capability was demonstrated by the assembly of Engineering Model Design Enhanced Micro Modules which are nonfunctional units designed to check a significant number of welds as well as the integrity of the structure before and after environmental exposure. Ten Stage Binary Divider Enhanced Micro Modules were assembled to demonstrate compatibility with monolithic integrated circuits. All the tools, fixtures, machines and processes were developed and are operational. (Author)

AD-621 745 See Fld. 17/9

AD-621 941 See Fld. 20/12

AD-622 090 See Fld. 20/12

AD-622 202 See Fld. 5/1

AD-622 221 See Fld. 20/14

9/2. COMPUTERS

AD-621 629 Div. 30/2
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF
STATE ASSIGNMENTS IN COMBINATIONAL NETWORKS.
Revised ed.,
by A. J. Nichols, and A. J. Bernstein. 1 Oct 64, 7p. Contract AF33 657 8777
Unclassified report

Pub. in IEEE Transactions on Electronic Computers vEC14 n3 p343-9 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 26 Feb 64.

Descriptors: (*Combinatorial analysis, Input-output devices), (*Input-output devices, Combinatorial analysis), (*Programming (Computers), Networks), Computer logic, Costs, Compatibility, Circuits

The problem of assigning codes to the output states of a multiple-output combinational circuit is considered. It is assumed that if the circuit has n inputs, then the 2n fundamental products, i.e., input states, are to be partitioned into disjoint groups, such that all members of the same group produce the same output state. The problem of coding the output states is studied here. Two algorithms for making the assignments are considered. The first gives those encodings for which the sum of the costs of all the output functions is minimum; the second minimizes the variable dependency of the output functions. In problems where reduced variable dependency is possible it has been found that the second algorithm yields minimum or near-minimum cost networks. Since this algorithm is easily applied it is useful for finding economical networks in situations where a large number of variables are involved since in such cases the first algorithm becomes lengthy. Attention is also directed to the problem of determining the optimum number of output variables to use for an encoding. An upper bound is derived and an example is presented which requires this bound. (Author)

AD-621 750 Div. 30/2 ,15/1
CFSTI Prices: HC $1.00 MF $0.50
STANFORD RESEARCH INST MENLO PARK CALIF
ALGEBRAIC THEORY OF SEMI-AUTOMATA CASCADES.
Scientific rept.,
by Michael Yoeli. 1 Aug 65, 19p. Rept. no. SR-2
Contract AF19 628 5092 Proj. 4641 Task 464101
AFCRL , 65-583
Unclassified report

Descriptors: (*Algebra, Automata), Cascade structures, Mathematical logic, Set theory

Cascade products of partially specified semi-automata (i.e., output-free automata) are defined and necessary and sufficient conditions are obtained for a semi-automaton to have a non-trivial representation as a homomorphic image of a subsystem of some cascade product of (simpler) semiautomata. The basic algebraic concepts of homomorphic relation and admissible covering play an important role in these investigations. (Author)

AD-621 798 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A PERMANENT-MEMORY DEVICE USING RESISTORS,
by A. Ya. Shpilberg, V. V. Petrov, and V. I.
Avgust. 20 Sep 65, 6p. Rept. no. FTD-TT-65-513
TT , 65-64049
Unclassified report

Unedited rough draft trans. of Russian patent 161 576, pub. 25 Feb 63, appl. 821532/26-24, 1p.

Descriptors: (*Computer storage devices, Resistors), Capacitors, Patents, USSR

Permanent-memory devices are known based on resistors which are designed in the form of matrices from mutually perpendicular address and charge bars at the cross points of which there are located resistors with the same devices on the passive elements with the recording of zero by means of supplying of voltage onto the respective vertical and horizontal for the elimination of connection between these bars. The device is distinguished from the known ones by the fact that for the different time delay of the signals of unity and zero to their address and digit bars condensers are connected in. (Author)

AD-621 836 Div. 30/2 ,15/1
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
MACHINE DEPENDENCE OF DEGREES OF DIFFICULTY,
by Michael Arbib, and Manuel Blum. 30 Dec 63, 7p. Contract AF33 616 7783 Grant ,NSF G16526
Unclassified report

Pub. in Proceedings of the American Mathematical Society v16 n3 p442-7 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Programming (Computers), Numerical methods and procedures), (*Computers, Mathematical models), Automata, Recursive functions, Monoids, Computer logic

A degree-of-difficulty relation for total recursive functions is defined by saying that f⅓ or = g (f is at least as difficult as g) if, to each program for computing f, there corresponds a program for computing g such that g (x) takes no more steps to compute than f (x) for almost all x. Such an ordering is highly dependent on the choice of a mathematical model for a computer. The degreeof-difficulty relation is modified so as to lessen the machine dependence.

AD-621 939 Div. 30/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AERO-ELECTRONIC TECHNOLOGY DEPT
FEASIBILITY OF LOW POWER ANNEALED MAGNETIC FILMS.
Final rept.,
by S. B. Greenberg. 30 Aug 65, 30p. Rept. no. NADC-AE-6503
Task WEP R360FR102 2021R011 01 01
Unclassified report

Descriptors: (*Metal films, Magnetic tape), (*Thin films (Storage devices), Metal films), Feasibility studies, Heat treatment, Computer storage devices, Iron alloys, Nickel alloys

The feasibility of using annealed low power thin permalloy films for information storage in computer memories was demonstrated. A memory exerciser was designed and built for simulation of memory operation. The optimum post-deposition anneal of 10 minutes at 300 C in a magnetic field along the transverse axis produced a reduction of 1/3 to 1/2 in read-drive current to as low as 200 ma without increasing the dispersion enough to make the films unusable. The switching time of annealed films was several nanoseconds, approximately the same as that for unannealed films. The annealing process was also shown to be useful for a 'bicore' type nondestructive readout film device. (Author)

AD-621 972 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
INFORMATION SYSTEMS LAB UNIV OF MICHIGAN ANN ARBOR
AN ANALYSIS OF ERRORS IN FINITE AUTOMATA.
Technical rept.,
by Philip S. Dauber. Apr 65, 17p. Rept. no. ISL-65-1 ,06920-1-T
Contract AF30 602 3546
Unclassified report

Descriptors: (*Automata, Errors), (*Computers, Reliability), Corrections, Probability, Feedback, Malfunctions, Networks

Errors in finite automata are studied. An error is defined as a pair of states and errors are then classified according to their probability of being corrected (i.e., being taken into the same state). Various results are then given on the partitioning properties of a particular type of error called a finite error. (Author)

AD-621 976 Div. 30/2
CFSTI Prices: HC $3.00 MF $0.75
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
AN EXPERIMENTAL STUDY OF THE USES OF TERNARY LOGIC IN DIGITAL COMPUTERS.
Master's thesis,
by Richard D. Friichtenicht. 1964, 92p.
Unclassified report

Descriptors: (*Digital computers, Computer logic), (*Computer logic, Digital computers), Binary arithmetic, Gates (Circuits), Switching circuits, Algebras

Digital computers presently in production are all binary logic machines, in that they are built with elements that have two stable states. Greater efficiency in computer speed and hardware would be obtained if elements with other than two states were used. Attempts are now in progress to find devices that have this property. The next logical step beyond binary would be ternary. A study of ternary algebras is made with emphasis on computer applications. Functional completeness and expansion theorems are introduced to show their usefulness in computer design. An adder circuit using three level logic is described and a measure of effectiveness using cost and complexity as criteria is made. It can be predicated that, as the binary computer approaches its ultimate in speed, more attention will be placed on N-valued logic machines. (Author)

AD-622 001 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
INTERARRIVAL STATISTICS FOR TSS.
Professional paper,
by E. G. Coffman,Jr., and R. C. Wood. 3 Aug 65, 14p. Rept. no. SP-2161
Contract SD97
Unclassified report

Descriptors: (*Programming (Computers), Scheduling), (*Scheduling, Computers), Optimization, Statistical functions, Stochastic processes, Queueing theory

The optimization of time-shared system performance requires the description of the stochastic processes governing the user inputs and the program activity. This paper provides a statistical description of the user input process in the SDC-ARPA general-purpose Time-Sharing System (TSS). The input process is assumed to be stationary, and to be defined by the interarrival time distribution. The data obtained appear to justify satisfactorily the common assumption that the interarrival times are serially independent. The data do not appear to justify, except as a very rough approximation, the usual assumption of an exponential distribution for interarrival time. A much more satisfactory approximation to the data can be obtained with a biphase or triphase hyperexponential distribution. (Author)

AD-622 003 Div. 30/2
CFSTI Prices: HC $3.00 MF $0.75
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
AN EMPIRICAL INVESTIGATION INTO THE BEHAVIOR OF THE SDC TIME-SHARING SYSTEM.
Professional paper,
by Robert A. Totschek. 27 Aug 65, 78p. Rept. no. SP-2191/000/00
Contract SD97
Unclassified report

Descriptors: (*Computers, Scheduling), Computer logic, Effectiveness, Multiple operation, Real time, Input-output devices, Optimization, Operations research

The behavior of a computer time-sharing system is intrinsically complex because such a system effects a compromise between allowing jobs to run to completion and allowing its several users simultaneous complete and immediate access to operate and debug their programs. It is generally known that computer systems that allow jobs to run to completion tend to maximize system efficiency: computer systems that offer the individual the most immediate possible response tend to maximize their utility to the user. It is also known that the relatively slow speeds of the I/0 devices that buffer individuals from computers (and vice versa) permit the time-sharing systems to service several users at a reasonable cost per user. The report attempts to make more precise statements about the behavior of the SDC time-sharing system, using data obtained from 13 one-hour recordings. These data include distributions of service and interarrival times, number of users, and overhead times. In addition, two scheduling logics are compared. Several measures of effectiveness, from both a system and an individual viewpoint are introduced and evaluated using these data. Some analyses have also been included to predict the effects of system changes. (Author)

AD-622 010 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
AN INTRODUCTION TO DATA STRUCTURING PROCESS.
Professional paper,
by William Landaeta. 30 Jun 65, 25p. Rept. no. SP-2136
Unclassified report

Descriptors: (*Computers, Data), Computer storage devices, Programming (Computers), Tables, Design

Introduces a basic technique for the design of a Data Table by presenting the idea that computer data structuring is analogous to the structuring of printed forms. Reports that the Data Table is made up of one or more of four types of entries with an entry consisting of one or more items. The main point of Data Table design presented in this paper is that all Data Tables are made up of basic components. States that generally, the type of computer memory has some effect on the Data Table design process; however, the basic design techniques and the Data Table components remain the same. (Author)

AD-622 012 Div. 30/2 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE STATIONARY BEHAVIOR OF A TIME-SHARING SYSTEM UNDER POISSON ASSUMPTIONS.
Professional paper,
by B. Krishnamoorthi. 3 Sep 65, 29p. Rept. no. SP-2090/000/00
Unclassified report

See AD-622 016.

Descriptors: (*Computers, Operations research), (*Scheduling, Computers), (*Queueing theory, computers), Statistical processes, Probability, Time, Mathematical analysis

In a recent paper (AD-611 866), the author analyzed a Markov chain imbedded in the stochastic process (X (t);t⅓ or = 0) where X (t) denotes the number of active channels at time t in a time-sharing system with both interarrival and service times exponential and a finite number of users. In this paper, by using renewaltheoretic arrangements, the limiting distribution of X (t) is obtained as t goes to infinity over all time points. The equilibrium waiting time has also been analyzed. (Author)

AD-622 013 Div. 30/2
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
OBSERVATIONS ON TIME-SHARED SYSTEMS.
Professional paper,
by Jules I. Schwartz. 15 Sep 65, 28p. Rept. no. SP-2046
Contract SD97
Unclassified report

Presented at the National ACM Conference (20th), Cleveland, Ohio, 24-6 Aug 65.

Descriptors: (*Computers, Scheduling), (*Data processing systems, Scheduling), (*Scheduling, Computers), Time, Operation

The paper discusses various considerations found necessary when planning an on-line time-shared installation, particularly from the point of view of users of such systems. Based mainly on experience with the Time-Sharing System at the System Development Corporation, actual situations are described in order to show where problems exist, and how advantages of such systems may be accrued. (Author)

AD-622 016 Div. 30/2 ,15/1
CFSTI Prices: HC $3.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
TIME-SHARED COMPUTER OPERATIONS WITH BOTH INTERARRIVAL AND SERVICE TIMES EXPONENTIAL.
Professional paper,
by B. Krishnamoorthi, and Roger C. Wood. 22 Sep 65, 51p. Rept. no. SP-1848/000/01
Contract SD97
AD , 611 866, SUPERSEDED
Unclassified report

Descriptors: (*Computers, Operations research), (*Scheduling, Computers), (*Queueing theory, Computers), Real time, Statistical functions, Systems engineering, Mathematical models, Mathematical analysis, Probability, Computer personnel, Effectiveness

The concept of time-shared computer operations is briefly described and a model of a time-sharing system is proposed, based on the assumption that both interarrival and service times possess an exponential distribution. Although the process described by this model is non-Markovian, an imbedded Markov chain is analyzed by exploiting the fact that the instants of completion of a 'quantum' of service are regeneration points. It is shown that user congestion possesses a limiting distribution, and the method of generating functions is used to derive this distribution. The concept of cycle time is discussed and two measures of cycle time developed for a scheduling discipline employing a single queue. A number of numerical examples are presented to illustrate the effect of the system parameters upon user congestion, system response time, and computer efficiency. (Author)

AD-622 017 Div. 30/2 ,32/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
STORAGE AND RETRIEVAL OF ASPECTS OF MEANING IN DIRECTED GRAPH STRUCTURES.
Professional paper,
by R. F. Simmons. 23 Sep 65, 22p. Rept. no. SP-1975/001/02
Contract SD97
Unclassified report

Presented at the 1965 AMC Working Conference on Pragmatics and Programming Languages', California Polytechnic Inst., San Dimas, Calif, 8-14 Aug 65.

Descriptors: (*Programming languages, Information retrieval), (*Language, Analysis), Dictionaries, Programming (Computers), Computer storage devices

An experimental system that uses LISP to make a conceptual dictionary is described. The dictionary associates with each English word the syntactic information, definitional material, and references to the contexts in which it has been used to define other words. Such relations as class inclusion, possession, and active or passive actions are used as definitional material. The resulting structure serves as a powerful vehicle for research on the logic of question answering. Examples of methods of inputting information and answering simple English questions are given. An important conclusion is that, although LISP and other list processing languages are ideally suited for producing complex associative structures, they are inadequate vehicles for language processing on any large scale, at least until they can use auxiliary memory as a continuous extension of core memory. (Author)

AD-622 018 Div. 30/2
CFSTI Prices: HC $3.00 MF $0.75
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
LISP 1.5 REFERENCE MANUAL FOR Q-32.
Technical memo.,
by S. L. Kameny. 9 Aug 65, 86p. Rept. no. TM-2337/101/00
Contract SD97
Unclassified report

Descriptors: (*Programming languages, Instruction manuals), (*Computers, Scheduling), Compilers, Computer storage devices

The document is a reference manual for the Q-32 LISP system in operation under the Time-Sharing System (TSS) on the AN/FSQ-32 computer. It describes the working of the LISP system, and contains descriptions of all currently available and installed functions, except for input-output and library functions given in TM-2337/102/00 (AD-622 022). This document conforms to the current numbering on LISP 1.5 documents, and supersedes TM-2430/000/00, which was a draft. (Author)

AD-622 020 Div. 30/2
CFSTI Prices: HC $3.00 MF $0.75
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
TRACE MODEL 1. TIMESHARED ROUTINES FOR ANALYSIS, CLASSIFICATION AND EVALUATION.
Technical memo.,
by William H. Moore,Jr., Robert J. Meeker, and Gerald H. Shure. 3 Sep 65, 58p. Rept. no. TM-2621
Contract SD286
Unclassified report

Descriptors: (*Programming (Compilers), Scheduling), (*Computers, Scheduling), Data, Analysis, Classification, Teletype systems, Feedback, Optimization

The document presents a user's and programmer's description of the TRACE program, which provides the user with an on-line technique for scanning data and deriving variables. The technique assists in creating and evaluating optimal indices for exhibiting relations among empirical data. TRACE is written in the timesharing system version of the JOVIAL language (JTS) for the AN/FSQ-32 computer at SDC. The on-line capability of the program permits immediate feedback to the user about the relative utility of derived indices and permits adoption or modification of these for further analyses. The time-sharing capability of the program permits efficient use of the computer in this process. (Author)

AD-622 021 Div. 30/2
CFSTI Prices: HC $5.00 MF $1.00
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE TINT USERS' GUIDE.
Technical memo.,
by Phyllis R. Kennedy. 30 Jul 65, 182p. Rept. no. TM-1933-000-03
Contract SD97
Unclassified report

Descriptors: (*Computers, Instruction manuals), (*Scheduling, Computers), Teletype systems, Compilers, Real time, Multiple operation, Programming (Computers), Computer personnel, Computer operators

The users' guide instructs the prospective Time Sharing user on how to use TINT, the On-Line Teletype JOVIAL Interpreter. The guide presents a brief introduction to the Time-Sharing System, a complete description of the dialect of the JOVIAL language that TINT interprets, and the TSS commands that are required when operating TINT. (Author)

AD-622 022 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
INPUT-OUTPUT FILE AND LIBRARY FUNCTIONS. THE Q-32 LISP 1.5 MOD. 2.5 SYSTEM.
Technical memo.,
by S. L. Kameny. 22 Sep 65, 16p. Rept. no. TM-2337-102-00
Contract SD97
Unclassified report

Descriptors: (*Programming languages, Instruction manuals), (*Computers, Scheduling), Compilers, Inputoutput devices, Computer storage devices, Magnetic tape

This document supplements TM-2337/101/00 (AD-622 018) by describing the input-output, file-handling and library functions of Q-32 LISP 1.5 Mod. 2.5. (Author)

AD-622 025 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
IS THE DATA PROCESSING FIELD SO DIFFERENT,
by F. J. Gruenberger. Sep 65, 5p.
Unclassified report

Descriptors: (*Data processing systems, Reviews), Theory

AD-622 110 Div. 30/2 ,32/3
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
COMPUTER-ASSISTED WRITING,
by Robert A. Magnuson. Jun 65, 13p. Rept. no. RAC-P-3
Unclassified report

Descriptors: (*Computers, Printing), (*Printing, Data processing systems), Punched cards, Costs, Computer storage devices, Systems engineering, Documentation, Automation

The reader is introduced to a new system for producing documents. A small computer (the IBM 1401) is used with the documents considered as data for the processing programs. Both the time and the cost required to produce a large technical document are substantially reduced. The reader is shown detailed examples of the system in operation. There are shown a number of new ideas and techniques for using commonly available equipment which make this system a breakthrough. (Author)

AD-622 284 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
PROGRAMMING IMPLICATIONS OF THE NRL AN/GYK3 (V) DISK STORAGE SYSTEM.
Interim rept.,
by R. H. Smith. Sep 65, 20p. Rept. no. 1649
Unclassified report

Descriptors: (*Disk recording systems, Computer storage devices), (*Computer storage devices, Disk recording systems), (*Data storage systems, Disks), (*Programming (Computers), Disk recording systems), Compilers, Control sequences, Computer logic, Digital computers, Naval research

The prototype AN/GYK-3 (V) computer was equipped with a limited amount of memory; thus, it was considered necessary to increase this memory capacity in order to permit the application of this machine to future work in radio propagation and to have available a larger prototype memory for production AN/GYK-3 (V)'s. The material presented here covers the programming implications of the NRL Disk Storage System. The system provides a fifteen fold increase in the on-line memory capacity as well as an unlimited increase in off-line capacity through the use of removable disk packs. The system consists of three IBM 1311 Disk File Drives and a File Control Unit (FCU) with each Disk File Drive having a capacity of 409,500 48-bit words. Read or write operations are accomplished with two modes of seek, Return to Home (RTH) and Direct, each rendering a minimum seek time under certain conditions. The average cylinder seek time is 250 ms for RTH and 150 ms for Direct. A special feature is included with this system allowing for a write check of written data without using valuable computer time.

AD-621 639 See Fld. 5/10

AD-621 736 See Fld. 14/5

AD-621 795 See Fld. 12/1

AD-621 907 See Fld. 12/1

AD-621 910 See Fld. 5/1

AD-621 934 See Fld. 17/2

AD-621 991 See Fld. 12/1

AD-622 005 See Fld. 12/1

AD-622 008 See Fld. 5/9

AD-622 015 See Fld. 5/10

AD-622 069 See Fld. 17/2

AD-622 117 See Fld. 17/2

AD-622 198 See Fld. 17/2

AD-622 212 See Fld. 5/9

AD-622 216 See Fld. 5/9

AD-622 283 See Fld. 20/6

9/3. ELECTRONIC AND ELECTRICAL ENGINEERNG

AD-622 038 Div. 7/2 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
OKLAHOMA STATE UNIV STILLWATER
SEPARATION CRITERIA OF A NONLINEAR CONTACT SYSTEM IN A STEADY STATE SINUSOIDAL VIBRATION ENVIRONMENT.
Doctoral thesis,
by Morris C. Burkhart. Aug 65, 85p. Proj. 7065
ARL , 65-168

Unclassified report

Descriptors: (*Vibration, Nonlinear systems), (*Junction boxes, Vibration), Separation, Electric relays, Damping, Mathematical analysis

A preloaded, idealized set of contacts with a hardening nonlinear restoring element was studied to determine the separation criteria when the set was subjected to a steady state sinusoidal excitation. The criteria were determined theoretically for an undamped set of contacts; the effect of damping on the undamped criteria was studied qualitatively; selected undamped criteria were tested experimentally and the effect of a nonlinear jump response on the theoretical separation criteria was investigated experimentally. The study covered several degrees of nonlinear restoring forces and included the separation criteria of a linear set of contacts as a special case.

AD-622 235 Div. 8/3 ,8/1
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
PASSIVE ELECTRONIC INTERCEPT TECHNIQUES AND DEVICES.
18 Mar 64, 87p. Rept. no. AID-U-64-15
TT , 65-64123

Unclassified report

Compilation of abstracts from Soviet open-source materials, Mar-Jun 58.

Descriptors: (*Radio interception, Electronic equipment), (*Electronic equipment, Radio interception), Abstracts, Radio receivers, Direction finding, Antennas, Ionospheric propagation, Data transmission systems, Radio equipment, Noise (Radio), Telemeter systems, Radar, Electromagnetic wave reflection, Range finding, Position finding, USSR

Abstracts are compiled from Soviet open-source materials on passive electronic intercept techniques and devices. The following topics are considered: receiving equipment; receive detection techniques; direction finding techniques; antennas; atmospheric propagation; data transmission and recording.

AD-621 835 See Fld. 9/4

AD-621 925 See Fld. 9/1

AD-621 975 See Fld. 9/5

9/4. INFORMATION THEORY

AD-621 713 Div. 8/7
CFSTI Prices: HC $3.00 MF $0.75
LINCOLN LAB MASS INST OF TECH LEXINGTON
THE COMPUTATION PROBLEM WITH SEQUENTIAL DECODING.
Technical rept.,
by John E. Savage. 16 Feb 65, 79p. Rept. no. TR-371 ,RLE-TR-439
Contract AF 19 628 500
ESD , TDR-65-52

Unclassified report

Descriptors: (*Decoding, Sequential analysis), Data transmission systems, Probability, Communication theory

Fano Sequential Decoding is a technique for communicating at a high information rate and with a high reliability over a large class of channels. However, equipment cost and variation in the time required to decode successive transmitted digits limit its use. This work is concerned with the latter limitation. Others have shown that the average processing time per decoded digit is small if the information rate of the source is less than a rate R-comp. This report studies the probability distribution of the processing time random variable and applies the results to the buffer overflow probability, i.e., the probability that the decoding delay forces incoming data to fill and overflow a finite buffer. It is shown that the overflow probability is relatively insensitive to the buffer storage capacity and to the computational speed of the decoder, but quite sensitive to information rate. In particular, halving the source rate more than squares the overflow probability. These sensitivities are found to be basic Sequential Decoding and arise because the computation per decoded digit is large during an interval of high channel noise and grows exponentially with the length of such an interval. A conjecture is presented concerning the exact behavior of the overflow probability with information rate. This conjecture agrees well with the (limited) experimental evidence available. (Author)

AD-621 801 Div. 8/7
CFSTI Prices: HC $1.00 MF $0.50
NEW YORK UNIV N Y LAB FOR ELECTRO-SCIENCE RESEARCH
FINITE MEMORY NONLINEAR FILTERING OF DIGITAL SEQUENCES.
Final rept., pt. 1, 1 Sep 64-31 Aug 65,
by Jack K. Wolf. 1 Oct 65, 18p. Contract DA31 124ARO D253 Proj. AROD 4949E
AROD , 4949:2

Unclassified report

Descriptors: (*Communication theory, Statistical functions), (*Statistical functions, Communication theory), Coding, Sequential analysis, Filters (Electromagnetic wave), Data transmission systems

The autocorrelation function of sequences generated by the non-linear filtering of binary maximal length sequences are derived. It is shown that the autocorrelation function of the filtered sequences, which are recognized as interleaved sequences, are similar to the autocorrelation function of the original maximal length sequence except for the addition of minor peaks. Other problems considered are the cross-correlation functions of interleaved two-level sequences, binary and non-binary sequences, binary and non-binary sequences orthogonal for all cyclic shift, the performance of an asynchronous multiple-access system and the hard limiting of non-binary sequences. (Author)

AD-621 832 Div. 8/7
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
A SIMPLE DERIVATION OF THE CODING THEOREM AND SOME APPLICATIONS,
by Robert G. Gallager. 11 Mar 64, 16p. Contract DA36 039AMC03200E Grant ,NSF GP2495

Unclassified report

Pub. in IEEE Transactions on Information Theory vIT-11 n1 p3-18 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Coding, Communication theory), (*Communication theory, Coding), Errors, Probability, Wave transmission, Theory

Upper bounds are derived on the probability of error that can be achieved by using block codes on general timediscrete memoryless channels. Both amplitude-discrete and amplitude-continuous channels are treated, both with and without input constraints. The major advantages of the present approach are the simplicity of the derivations and the relative simplicity of the results; on the other hand, the exponential behavior of the bounds with block length is the best known for all transmission rates between 0 and capacity. The results are applied to a number of special channels, including the binary symmetric channel and the additive Gaussian noise channel. (Author)

AD-621 835 Div. 8/7 ,8/3
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE

GENERALIZED SNR AND PERFORMANCE INDEX OF FILTERS FOR WAVEFORM ESTIMATION.
Revised ed.,
by V. R. Algazi. 12 May 65, 1p. Contract DA36 039AMC03200E Grant ,NSF GP2495
Unclassified report

Pub. in Proceedings of the IEEE v35 n7 p725-6 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 30 Apr 64.

Descriptors: (*Signal-to-noise ratio, Filters (Electromagnetic wave)), (*Filters (Electromagnetic wave), Performance (Engineering)), Noise (Radio), Optimization

A definition is presented of a generalized signal-tonoise ratio for noisy signals. The signal-to-noise ratio of optimum mean-square filters is discussed. The signal-to-noise ratio performance of filters is shown to be a misleading measure of their merit.

AD-621 901 Div. 8/7
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
ORTHOGONAL DETECTION TO REDUCE COMMON CHANNEL INTERFERENCE,
by T. H. Crystal. 17 Mar 65, 2p. Contract DA36 039AMC03200E ,AF19 628 3325
Unclassified report

Pub. in Proceedings of the IEEE v53 n7 p742-3 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Noise (Radio), Side bands), Interference, Modulation, Demodulation, Fourier analysis

It is shown that, since DSB is a linear modulation procedure which creates two shifted versions of the modulating signal spectrum, two DSB signals with overlapping spectra may be separated perfectly, rather than approximately, by a finite linear demodulation procedure. Because of the linearity of the modulation and demodulation process, there is no justification for comparison with nonlinear schemes nor for extending this procedure for more signals.

AD-622 202 See Fld. 5/1

9/5. SUBSYSTEMS

AD-621 712 Div. 8/1
CFSTI Prices: HC $2.00 MF $0.50
CENTRAL RADIO PROPAGATION LAB BOULDER COLO
THEORY OF A SLOTTED-SPHERE ANTENNA IN COMPRESSIBLE PLASMA, PART III.
Scientific rept.,
by J. R. Wait, and K. P. Spies. 11 Aug 65, 31p.
Rept. no. SR-28 (III)
Contract PRO65 504 Proj. 4600 Task 460004
AFCRL , 64-472, PT.3
Unclassified report

Descriptors: (*Slot antennas, Theory), (*Plasma physics, Slot antennas), Numerical analysis, Electrical conductance, Dielectrics, Electromagnetic waves, Compressible flow, Spheres

Numerical results are presented for the conductance and susceptance of a slotted-sphere antenna which is immersed in a compressible, isotropic, and lossless electron plasma. Previous series expansions for the parameters of interest are cast in a form suitable for numerical work. The results indicate that an appreciable fraction of the power radiated is in the form of electroacoustic waves. However, this fraction may be significantly reduced if the sphere is surrounded by an electron depletion layer (i.e., a sheath) whose thickness is somewhat greater than a Debye length. (Author)

AD-621 751 Div. 8/1 ,25/3 ,8/6
CFSTI Prices: HC $2.00 MF $0.50
ARIZONA UNIV TUCSON ENGINEERING EXPERIMENT STATION
FURTHER EXPERIMENTAL STUDY OF PLASMA SHEATH EFFECTS ON ANTENNAS.
Scientific rept. for Jan-Jul 65,
by G. Tyras, and John M. Hamm. Jul 65, 44p.
Rept. no. SR-2
Contract AF19 628 3834 Proj. 4642 Task 464202
AFCRL , 65-608
Unclassified report

Descriptors: (*Antenna radiation patterns, Plasma sheath), (*Plasma sheath, Antenna radiation patterns), Slot antennas, Electrical impedance, Antenna configurations, Simulation

The plasma sheath simulation technique developed earlier was use to investigate the effects of various types of sheath discontinuities and inhomogenities on a slot antenna radiation pattern and input impedance. In the case of semi-infinite and finite-extent homogeneous plasma sheaths, the radiation pattern and the impedance characteristic are investigated with regard to the geometry of the discontinuity and its proximity to the slot antenna. It is found that the radiation pattern is unaffected by the discontinuity as long as the ratio of the distance between the source and the discontinuity to the sheath thickness is of the order of 20 or greater. When the sheath is made finite in extent, with a discontinuity on each side of the slot, the resulting pattern is seen to be a superposition of the effects of each discontinuity acting separately. The effects produced by inhomogeneities are found to be similar to those of a homogeneous sheath with a cetain equivalent dielectric constant. For both the homogeneous and inhomogeneous sheaths, favorable comparison with the available theory is obtained. (Author)

AD-621 975 Div. 8/1 ,7/3
CFSTI Prices: HC $6.00 MF $1.25
GENERAL ELECTRIC CO SCHENECTADY N Y ADVANCED TECHNOLOGY LABS
ULTRA HIGH POWER TRANSMISSION LINE TECHNIQUES.
Final rept.,
by John P. Quine, C. Younger, and J. W. Maurer. Sep 65, 214p. Contract AF30 602 2990 Proj. 5573 Task 557301
RADC , TR-65-164
Unclassified report

Descriptors: (*Transmission lines, Microwave equipment), (*Waveguides, Microwave equipment), Power, Waveguide bends, Waveguide couples, Waveguide windows, Power dividers

Systematic procedures were developed for selecting optimum waveguide configurations and designing waveguide components that will operate at high levels of peak and average power in the frequency range 1-10 gigacycles. In particular, the feasibility was investigated of designing compact components such as bends, couplers, power dividers, tapers, and mode absorbers in waveguides having cross section dimensions in the range 1.5 to 2.5 free space wavelengths. The results of studies of the dissipation and mode conversion losses and high power handling capability of long runs of oversized waveguide are presented. The results of a theoretical and experimental study of the required tolerances for flanges in oversized waveguide are presented. The results of a theoretical and experimental study of the required tolerances for flanges in oversized rectangular waveguide are also presented. Theoretical designs are discussed for system components such as tapers, bends, directional couplers, mode absorbers and pressure windows. Low power and high power test results are presented for tapers, bends, and a -20 db directional coupler. (Author)

AD-621 977 Div. 8/1
CFSTI Prices: HC $3.00 MF $0.75
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
ELECTRONICALLY SCANNED ANTENNAFIER USING TUNNEL DIODES AND VARACTOR PHASE SHIFTERS.
Master's thesis,
by John F. Kropf. 1964, 83p.
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Spiral antennas, Scanning), (*Phased arrays, Radar scanning), Tunnel diodes, Varactor diodes, Phase shifters, Tuning devices, S band, Noise (Radio), Microwave amplifiers, Antenna components, Airborne, Waveguide couplers, Frequency shift, Ferromagnetic materials, Phase shift, Mixers (Electronic)

The electronic scanning antenna array has many advantages over the conventional antenna system. This thesis proposes the marriage of a low noise tunnel diode amplifier and varactor phase shifter at the antenna to scan and amplify. A different method of tuning varactor phase shifters is proposed, along with a simple method of designing tunnel diode amplifiers using the Smith Chart for determining design parameters. The final design consists of a two element sample array using four tunnel diodes and two varactors in a strip-line circuit directly behind an S-band spiral antenna. (Author)

AD-622 207 Div. 8/1 ,30/6
CFSTI Prices: HC $2.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB
USE OF ABNORMAL GLOW DISCHARGES FOR ANTENNA BREAKDOWN TESTS.
Interim scientific rept. no. 2, Jan-Aug 64,
by Eugene E. Covert, Edgar Alzner, and James B. Coffin,Jr.. Jan 65, 31p. Rept. no. TR-104
Contract AF19 628 2434 Proj. 4642 Task 464202
AFCRL , 65-530
Unclassified report

Descriptors: (*Antennas, Environmental tests), (*Wind tunnels, Electron density), (*Controlled atmospheres, Electrons), Glow discharges, Electrodes, Plasma physics, Experimental data, Thermionic emission, Photoelectric effect, Electric discharges, Radiofrequency power, Performance (Engineering), Very high frequency, Ultrahigh frequency

The report describes the studies that have been carried out to find a method for adding electrons to the wind tunnel air stream. The studies were both theoretical and experimental. The experimental studies were carried out under static conditions (no air flow). (Author)

AD-622 226 Div. 8/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
EXPERIMENTS TO DETERMINE THE EFFECTIVENESS OF ANTENNA GROUND PLANES,
by F. E. Boyd, and W. E. Gustafson. Sep 65, 18p. Rept. no. nrl memo. rept.-1646
Unclassified report

Descriptors: (*Phased arrays, Effectiveness), Antenna configurations, Ground (Electrical), Radio waves, Antenna radiation patterns, Gain, Costs, Underground antennas

Experiments to determine the effectiveness of practical antenna ground planes show that a mesh

with 0.05 wavelength spacing is a good compromise between cost and effectiveness under average conditions. This figure could be radically modified should special requirements prevail or different ground conditions exist. Variation of antenna pattern due to ground moisture content is measurable, amounting to as much as several decibels. Burial of ground plane wires is not recommended since it reduces the effectiveness when used in the H.F. or higher bands. (Author)

AD-622 270 Div. 8/1 ,25/3
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB
WIND TUNNEL STUDIES OF ANTENNA BREAKDOWN. PART II. SHEATH SIMULATION IN THE WIND TUNNEL.
Scientific rept.,
by Eugene E. Covert, James B. Coffin,Jr., and Laurence R. Boedeker. Mar 65, 71p. Rept. no. SR-3
Contract AF19 628 2434 Proj. 4642 Task 464202
AFCRL , 65-618
Unclassified report

See also AD-603 036.

Descriptors: (*Antennas, Plasma sheath), (*Plasma sheath, Simulation), Wind tunnels, Very high frequency, Plasma physics, Velocity, Water vapor, Electric discharges, X band, Charged particles, Density, Plasma jets, Electron, Gas flow

This report describes the studies that have been carried out to illustrate the effect of velocity in the breakdown of a VHF antenna. The report describes the effect of mounting position and the effect of water vapor content in the wind stream on the antenna breakdown. The report also describes the initial operation of an arc jet to be used as a source of electrons in the wind stream for antenna breakdown testing. Ion density and electron temperature measurements were made in the ionized nitrogen layer over the X-band antenna using a double Langmuir probe. Results of a one-dimensional analysis indicate ion densities between 10 to the 10th power and 10 to the 11th power particles/cc and an ionized layer thickness of about 0.3 inches. Electron temperatures seemed low and circuit drift is the possible explanation. Charged particle densities calculated from measured enthalpies were higher than those derived from the probe data. Extension of the range of the plasma jet to higher charged particle densities is discussed. The range of parameters in the experiment pertinent to the Langmuir probe problem is presented and the use of more exact theories is discussed. (Author)

AD-621 635 See Fld. 10

AD-621 726 See Fld. 10

AD-621 806 See Fld. 10

AD-621 824 See Fld. 10

AD-621 995 See Fld. 17/9

AD-622 235 See Fld. 9/3

AD-622 267 See Fld. 10

10. ENERGY CONVERSION (NON-PROPULSIVE)

AD-621 635 Div. 7/6 ,7/5 ,16/3
CFSTI Prices: HC $2.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
BIOCHEMICAL FUEL CELLS.
Technical rept.,
by John A. Christopulos. Aug 65, 27p. Rept. no. ECOM-2616
Proj. 1C0 14501A34A Task 1C0 14501A34A00
Unclassified report

Descriptors: (*Fuel cells, Biochemistry), (*Alcohols, Fuel cells), Feasibility studies, Buffers (Chemistry), Electrolytes, Oxidation, Electrochemistry, Reaction kinetics, Glucose, Yeasts, Electrodes

Laboratory investigations were performed to determine the feasibility of the ethanol/air biochemical fuel cell system. The direct biocell was found incapable of high electrical energy output. The indirect biocell with buffer electrolyte has shown a ten-fold increase in current density over that of the direct system. The major problem of this biocell system is the incomplete electrochemical oxidation of ethanol. A factorial design plan was used to evaluate kinetics of alcoholic fermentation. Evaluation of results indicated that 1% ethanol can be generated in 1 hour. One per cent ethanol is the minimum fuel concentration required for this system. (Author)

AD-621 726 Div. 7/6 ,7/5
CFSTI Prices: HC $5.00 MF $1.00
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
DIRECT ENERGY CONVERSION IN THE USSR, THERMIONIC CONVERTERS.
Rept. no. 3.
22 Sep 65, 155p. Rept. no. ATD-P-65-57
TT , 65-64029
Unclassified report

Rept. on Surveys of Soviet-Bloc Scientific and Technical Literature.

Descriptors: (*Thermionic converters, Energy conversion), (*Energy conversion, Thermionic converters), Thermionic emission, Voltage, Space charges, Transport properties, Plasma physics, Ionization, USSR

CONTENTS: Thermoelectron emission; Volt-ampere characteristic and difference of contact potential; Positive surface ionization and evaporation heats; Space-charge and its neutralization; Transport phenomena; Qualitative theory of plasma thermoelements; Classification schemes; Vacuum with current limited by space-charge; Vacuum with space-charge compensated (Anselm's theoretical study; Rectilinear-path mode; Ioffe's concept of a plasma thermocouple; Simple diffusion mode (Moyzhes-Pikus Theoretical Study); Phenomena at increased plasma pressures; Discharge mode (Baksht-Moyzhes Theoretical Study); Arc mode.

AD-621 806 Div. 7/6 ,7/5
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
THE METHODS OF DIRECT CONVERSION OF ENERGY,
by G. V. Lashkarev, and V. S. Fomenko. 6 Dec 63, 9p. Rept. no. AID-T-63-119c
TT , 65-64059
Unclassified report

Trans. of Akademiya Nauk SSSR. Izvestiya. Energetika i Transport, n4 p145-50 1962.

Descriptors: (*Energy conversion, Symposia), Thermionic converters, Magnetohydrodynamics, Thermoelectricity, Thermionic emission, Fuel cells, USSR

Papers are presented on problems of direct conversion of energy by the magneto-gas-dynamic, thermoelectronic, thermoelectric, and chemical methods. Ten reports and communications were presented on the physical fundamentals, experimental results, and some problems of the theory and practice of designing various converters.

AD-621 824 Div. 7/6 ,7/5 ,4/4
CFSTI Prices: HC $6.00 MF $1.25
CALIFORNIA UNIV BERKELEY
TRANSPORT PROCESSES IN ELECTRODE SYSTEMS.
Final rept. for 16 Mar 62-1 Mar 65,
by D. N. Bennion, T. W. Chapman, S. L. Gordon, R. G. Hickman, and G. L. Horvath. Mar 65, 250p. Contract DA36 039SC89153 Proj. arpa order 220 61
Unclassified report

Descriptors: (*Electrodes, Transport properties), (*Electrolytic cells, Electrodes), Energy conversion, Electrochemistry, Anodes (Electrolytic cells), Cathodes (Electrolytic cells), Reaction kinetics, Fuel cells, Electrolytes, Cyanides, Potassium compounds, Sodium compounds, Hydroxides, Diffusion

Contents: Current distribution at a gas-electrode electrolyte interface; Ionic mass transport by combined free and forced convection; The role of ionic migration in electrolytic mass transport; diffusivities of (Fe (CN)6) (3-) and (Fe (CN)6) (4-) in KOH and NaOH solutions; Mass transfer in concentrated binary electrolytes; The solubility and diffusion coefficient of oxygen in KOH; Ionic mass transport and current distribution in channels at high velocity flow; Transport properties of concentrated electrolytic solutions.

AD-622 267 Div. 7/6 ,7/5
CFSTI Prices: HC $4.00 MF $0.75
HAMILTON STANDARD DIV UNITED AIRCRAFT CORP BROAD BROOK CONN
MODULAR DESIGN OF IMPROVED SOLAR CONVERTERS.
Progress rept. no. 8 (Final), 1 Jun 61-26 Mar 65, by William J. Moriarty. 26 Mar 65, 102p. Rept. no. HSER-3089
Contract DA36 039sc87461 Proj. DA1C6 22001A053 Task 1C6 22001A053 03
Unclassified report

See also AD-418 154.

Descriptors: (*Solar panels, Modules (Electronic)), (*Solar cells, Manufacturing methods), Silicon, Adhesives, Composite materials, Bonding, Extendable structures, Portable, Packaging, Maintenance, Coatings, Plastics, Glass textiles

The material study program summary includes: detailed desirable characteristics for both the adhesive and solar cell protective coating; evaluation of the actual characteristic of adhesive and coating materials selected for consideration; description and basis for selection of the final design which consisted of an LTV-602/plexiglas/shingled silicon solar cell composite bonded to an aluminum substrate with a flexible silicon adhesive; and a detailed module repair procedure supported by photographs. Operating units of two basic types of solar array converters were designed and developed under this contract. The 10-20 Sq. Ft. Array is designed for semipermanent installation and may be broken down into several portable sections for transportation. The more versatile Special Warfare Array is a one-man carrying unit designed for special warfare and guerilla operations. The design basis, the evolution of design to meet the mechanical and electrical design requirements including the engineering basis for the design changes involved outlined; this also encompasses the solar cell characteristics, voltage and power requirements, wiring layout and weight breakdown for both basic array types. Supporting calculations, graphs and photographs are included. (Author)

11/2. CERAMICS, REFRACTORIES, AND GLASSES

AD-621 920 Div. 14/2 ,14/6 ,14/7
CFSTI Prices: HC $2.00 MF $0.50
SPRINGFIELD ARMORY MASS
OCCLUSION OF VARIOUS REFRACTORY MATERIALS IN CHROMIUM PLATE ON STEEL SUBSTRATES.
Technical rept.,
by Francis X. Hassion, and Joseph Szanto. 16 Aug 65, 43p. Rept. no. SA-TR18-1091
Proj. M1 3 23043

Unclassified report

Descriptors: (*Chromium, Plating), (*Refractory materials, Electrodeposition), (*Steel, Chromizing), (*Cermets, Electrodeposition), Wear resistance, Chromium, Metal coatings, Composite materials, Hardness, Surface properties, Scattering, Thorium compounds, Zirconium compounds, Oxides

Falex test pins plated at moderate current densities from standard chromium baths containing dispersoids of diamond dust, zirconia or thoria at volume concentrations of about 1 per cent do not exhibit unusual wear characteristics. Falex test pins plated under similar conditions at high current densities show higher hardness and correspondingly improved wear resistance. The particle weights occluded in chromium plate deposited at high current densities amount to about 1 per cent - an order of magnitude improvement over that achieved at conventional current densities and bath concentrations of dispersoid amounting to approximately 1 per cent. Photomicrographs of both dispersed thoria and zirconia particles are included. Procedure is described and results are discussed. (Author)

AD-621 708 **See Fld. 20/2**

11/3. COATINGS, COLORANTS, AND FINISHES

AD-621 714 Div. 14/7 ,13/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
FIRST SEMIANNUAL EVALUATION OF EXTERIOR CONCRETE AND MASONRY PAINTS.
Interim technical note for Jun 64-Jan 65,
by Joseph B. Crilly. 12 Aug 65, 19p. Rept. no. TN-N-735
Proj. Y F020 03 03 003

Unclassified report

Descriptors: (*Paints, Concrete), (*Concrete, Paints), Environmental tests, Moistureproofing, Test methods

Eight paints have been exposed on four masonry substrates, concrete brick and block, cinder block and expanded aggregate block. Three exposure sites, Kwajalein, Marshall Islands; Kaneohe, Hawaii; and, Port Hueneme, California, have been used. After 6 months on Kwajalein, paints based on styrene-butadiene and styreneacrylate solutions have begun to fail. These paints have recently been covered by Federal Specification TT-P-0097. (Author)

AD-622 098 Div. 14/7 ,4/2 ,4/3
CFSTI Prices: HC $0.50 MF $0.50
COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND MD
TITRIMETRIC DETERMINATION OF ACETATE AND FREE ALKALI IN THE PRESENCE OF ALKALI SALTS.
Final rept.,
by George C. Esposito. 13 Sep 65, 11p. Rept. no. CCL-186
Proj. 1C024401A329

Unclassified report

Descriptors: (*Tin coatings, Impurities), (*Acetates, Volumetric analysis), (*Alkali metal compounds, Volumetric analysis), Stannates, Chromatographic analysis, Organic compounds, Salts

A rapid, accurate volumetric procedure is described for the determination of acetate and free alkali in stannate immersion baths. Both determinations are made on one sample with no interference from phosphate, stannate and carbonate salts. Gas liquid chromatograph (GLC) is used qualitatively to detect salts of other organic acids. (Author)

AD-622 116 Div. 14/7 ,18/3 ,31/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
SUBMARINE TOPSIDE COATINGS FOR APPLICATION IN COLD, DAMP WEATHER.
Final rept.,
by D. E. Field. 21 Sep 65, 20p. Rept. no. NRL-6308
Proj. SR007 08 05 1201

Unclassified report

Descriptors: (*Coatings, Submarine), (*Submarines, Maintenance), (*Plastic paints, Submarines), Performance (Engineering), Isocyanate plastics, Epoxy plastics, Polyamide plastics, Paint primers, Corrosion inhibition, Low-temperature research, Humidity, Environmental tests

To develop a coating for this purpose, special equipment was devised and constructed in the laboratory to simulate both the weather conditions under which the coatings must be applied and the environment they must endure. Although all experimental one-package coatings using water-displacing solvents lacked adequate adhesion and durability, two multi-package systems proved successful. These systems were the epoxy-polyamide and the moisture-cured urethane. Although both of these systems showed good durability in service, the urethane system was chosen for further development, since it would cure to a serviceable coating far more rapidly under these severe weather conditions. As a result of this research, three paints were developed using the same vehicle and pigment ratios - an anticorrosive primer, a flat black topcoat, and a white tint-base to mix with the flat black for making various specified grays. Formulations and suggested specifications for these paints have been developed. (Author)

AD-621 779 **See Fld. 13/8**

AD-621 894 **See Fld. 11/5**

AD-621 920 **See Fld. 11/2**

AD-622 095 **See Fld. 13/2**

AD-622 280 **See Fld. 11/6**

11/5. FIBERS AND TEXTILES

AD-621 894 Div. 14/4 ,14/7
CFSTI Prices: HC $1.00 MF $0.50
QUARTERMASTER RESEARCH AND ENGINEERING COMMAND NATICK MASS TEXTILE FUNCTIONAL FINISHES LAB
FLAMEPROOFING OF NYLON FABRICS,
by Thomas D. Miles, and Francis A. Hoffman. Sep 57, 7p. Rept. no. 173

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Fire-resistant coatings, Nylon), (*Nylon, Fire-resistant coatings), (*Fire-resistant textiles, Nylon), Fibers (Synthetic), Synthetic rubber, Flame arresters, Additives, Chemical compounds, Polymers, Protective treatments

This report summarizes work that has been done to develop a finish capable of rendering nylon fabrics flame and drip-proof. If such a finish were available, the high strength and low weight characteristics of nylon could be used to advantage in lightweight tentage. The flaming and dripping of molten nylon when the fabric is ignited is undesirable. The flaming melt presents a dual hazard: it may propagate flaming as it drips into flammable material and it can cause serious burns to personnel both from the flaming and from the fact that the molten nylon adheres to the skin and releases heat as it cools. A preliminary investigation to remedy this condition was initiated when it was noted that neoprene coated nylon, when ignited, burned but did not drip after combustion and left a crisp paper-like char.

AD-621 685 **See Fld. 1/5**

11/6. METALLURGY AND METALLOGRAPHY

AD-621 725 Div. 17/2
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF ENGINEERING RESEARCH
A BORIDE WITH CR23C6 STRUCTURE IN THE SYSTEM NICKEL-ZIRCONIUM-BORON (EIN BORID MIT CR23C6STRUKTUR IM SYSTEM NICKEL-ZIRKON-BOR),
by H. H. Stadelmaier, and B. B. Helms. 1965, 2p.

AROD , 5010:2

Unclassified report

Pub. in Metall v19 n2 p121-2 1965 (Copies available only to DDC users). Text in German.

Descriptors: (*Borides, Crystal structure), Nickel alloys, Zirconium alloys, Chromium compounds, Carbides, Intermetallic compounds, Boron alloys

Die Gleichgewichte um die Phase der annahernden Zusammensetzung Ni21Zr2B6 im Dreistoffsystem NickelZirkon-Borsind durch eine Schmelzflachenprojektions owie einen isothermen Schnitt bei 800C beschrieben worden. Die ternare Phase hat die Struktur des Chromkarbids Cr23C6 mit einer Gitterkonstarte von 10,56 bis 10,682A. Wie alle bisher untersuchten Boride dieser Art, ist das vorliegende eine kongruent schmelzende Phase. (Author)

AD-621 743 Div. 17/2 ,31/3
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON DC
MARINE CORROSION STUDIES: STRESS-CORROSION CRACKING, DEEP OCEAN TECHNOLOGY, CATHODIC PROTECTION, AND CORROSION FATIGUE.
Interim progress rept. no. 3,
by B. F. Brown, B. W. Forgeson, T. J. Lennox,Jr., T. C. Lupton, and R. L. Newbegin. Jul 65, 93p.
Rept. no. nrl memo. rept. 1634
Proj. SR007 08 11 ,SR007 08 44 5510

Unclassified report

See also AD-610 551.

Descriptors: (*Corrosion, Sea water), (*Stresses, Corrosion), (*Cathodic protection, Steel), (*Titanium alloys, Corrosion), Fracture (Mechanics), Aluminum alloys, Niobium alloys, Tantalum alloys, Molybdenum alloys, Vanadium alloys, Tin alloys, Corrosion inhibition, Sodium compounds, Chromates, Aluminum alloys, Antifouling coatings, Electrolysis, Anodes, Cathodes

Contents: stress-corrosion cracking of titanium alloys in salt water, fresh water, and sea water; stress-corrosion cracking tests on welded titanium alloy plates; a new stress-corrosion cracking test procedure for high strength alloys; a study of the stress factor in corrosion cracking by use of the pre-cracked cantilever beam specimen; a study of the crystallographic orientation of cleavage facets produced by stress-corrosion cracking of Ti-7Al-2Cb-1Ta in distilled water; the effectiveness of sodium chromate to inhibit stress-corrosion crack propagation in aisi 4340 steel; metallic corrosion and cathodic protection to 5652 foot ocean depths; performance of tributyl tin oxide and cuprous oxide antifouling paints on 5086-H32 and 6061-T6 aluminum alloys in sea water and river water exposures; status report on the current distribution along a wire rope cathode; inoperative galvanic anodes related to improper chemical composition of the zinc; determination of the effective driving potential and effective d.c. resistance of galvanic anodes; low cycle fatigue crack propagation in 'wet environments'.

AD-621 749 Div. 17/7 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
STANFORD UNIV CALIF DEPT OF MATERIALS SCIENCE
DISPERSION SOFTENED ZINC ALLOYS.
Technical rept.,
by W. H. McCarthy, J. C. Shyne, and O. D. Sherby. 1 Sep 65, 9p. Rept. no. TR-10 ,SU-DMS-65-35
Contract Nonr22560 Proj. NR031 682
Unclassified report

Descriptors: (*Zinc alloys, Powder metallury), Tungsten alloys, Powder alloys, Aluminum compounds, Oxides, Carbon black, Composite materials, Corundum, Zinc compounds, Tensile properties, Ductility, Stresses, Creep, Heat treatment

Room temperature tensile tests were performed on zinc alloys containing submicron particles of Zn0, alpha A1203, carbon black and tungsten. Dispersion softening and substantial improvements in ductility as compared to pure zinc were observed when spheroidal particles were used. Strain softening was also encountered. The results are briefly explained on the basis of the fine and duplex slip which was observed in the composites. Stress field heterogeneity and thermal expansion effects were also considered. (Author)

AD-621 766 Div. 17/7 ,25/6
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
THE INTERPRETATION OF THE HALL EFFECT IN THE SILVER-GOLD SYSTEM.
Revised ed.,
by C. M. Hurd. 23 Mar 65, 6p. Rept. no. NRC-8543
Unclassified report

Pub. in Philosophical Magazine v12 n115 p47-51 Jul 1965 (Copies available only to DDC users). Revision of manuscript received 23 Feb 65.

Descriptors: (*Hall effect, Silver alloys), (*Silver alloys, Gold alloys), (*Gold alloys, Silver alloys), Band spectrum, Temperature, Atomic structure, Theory

It is suggested that in the Ag-Au system the effects upon the Hall coefficient of the impurity scattering and the band structure can be separated. Further information is then obtained about the temperature dependence of these effects. (Author)

AD-621 802 Div. 17/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
FORMATION MECHANISM OF DOUBLE-LAYER OXIDE SCALE ON COPPER--ZINC ALLOYS,
by Lucjan Czerski, Stanislaw Mrowec, and TeodorWerber. 6 Dec 63, 12p. Rept. no. AID-T-63-119d
TT , 65-64063
Unclassified report

Trans. of Archiwum Hutnictwa (Poland) v3 n2 p113-23 1958.

Descriptors: (*Oxidation, Copper alloys), (*Copper alloys, Zinc alloys), (*Zinc alloys, Copper alloys), Oxides, Reaction kinetics, Diffusion

The results obtained by the 'marker' method show that the double layer of scale forms on the alloys as a result of an outward diffusion of metal and an inward diffusion of oxygen. The 'marker' in all instances was found at the boundary of both layers of scale. Investigations of the chemical composition of the scale showed that the outer layer regardless of alloy composition consists of cuprous oxide Cu2O, while the inner layer consists of a two-phase mixture of Cu2O and ZnO. Furthermore, it is shown that the inner layer is of unstable composition and varies with distance from the metallic core. The highest ZnO content was always found near the scale-alloy interface. (Author)

AD-622 032 Div. 17/2
TOHUKU UNIV SENDAI (JAPAN)
ON THE NATURE OF PERITECTIC REACTION AND THE MECHANISM OF THE GRAIN REFINEMENT RESULTING THEREFROM,
by Keizo Iwase, Ju-n Asato, and Nobuyuki Nasu. 20 Feb 36, 20p.
Unclassified report

Pub. in Anniversary Volume of the Science Reports of the Tohoku Imperial Univ., Series 1, p652-69 1936 (Copies available only to DDC users).

Descriptors: (*Phase studies, Alloys), (*Grain structures (Metallurgy), Phase studies), Japan, Copper alloys, Iron alloys, Aluminum alloys, Antimony alloys, Tin alloys, Lead alloys, Crystallization, Solid solution

Alpha alloys rich in Cu the size of the crystal grain become very fine when an adequate amount of Fe or Co is added to cause peritectic reaction. Similar phenomena was found in the case of peritectic alloys other than alpha alloys rich in Cu though the degrees of the refinement are less than in the case of the latter. The nature of the peritectic reaction was studied. The contact between the primary crystal and the melt should be increased in the course of the peritectic reaction in order that the system should change so as to conform to the equilibrium diagram as possible. This requirement is fulfilled when the disintegration of the primary crystal takes place in the course of the reaction. The disintegrated fragments of the primary crystal may have different orientations with each other, though they are produced from its mother dendrite, and behave as separate nuclei for further peritectic reaction. The enveloping phenomenon of the primary cyrstal by the secondary is a result of an establishment of an apparent equilibrium. Enveloping phenomenon takes place to a less extent in the ease of ternary alloys than in that of binary alloys. These conclusions were satisfactorily proved to be correct by experiments on Sb-Sn-Pb alloys.

AD-622 034 Div. 17/5 ,17/2
CFSTI Prices: HC $3.00 MF $0.50
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
HIGH-TEMPERATURE CALORIMETRY OF THE IRONVANADIUM ALLOY SYSTEM.
Masters' thesis,
by Robert Lee Rapson. Jun 65, 56p. Rept. no. GME/ME/65-1
Unclassified report

Descriptors: (*Iron, Enthalpy), (*Vanadium, Enthalpy), (*Iron alloys, Enthalpy), (*Vanadium alloys, Enthalpy), High-temperature research, Thermodynamics, Calorimeters

High-temperature heat content data were obtained for the iron-vanadium alloy system by means of a diphenyl ether drop-type calorimeter. Data were compiled for pure iron, pure vanadium, and three representative alloys of iron and vanadium, over the temperature range from 600 to 1500 K. The results for the pure metals showed good agreement with published values. The alloy data followed smooth curves and exhibited behavior consistent with the thermal anomalies in the alloy system. Deviations from Kopp's Law, of the experimentally determined alloy heat capacities, showed a trend toward positive values with increasing temperature. The heats of formation for the alloys exhibited a change in sign from negative to positive at high temperatures. (Author)

AD-622 234 Div. 17/2 ,17/6 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF MATERIALS SCIENCES LAB
THE RELATION BETWEEN FLOW STRESS AND DISLOCATION STRUCTURE DURING RECOVERY OF HIGH-PURITY ALUMINUM,
by J. L. Lytton, K. H. Westmacott, and L. C. Potter. 9 Dec 64, 9p. Contract AF33 657 10281
Unclassified report

Pub. in Transactions of the Metallurgical Society of AIME v233 p1757-65 Sep 1965.

Descriptors: (*Aluminum, Heat treatment), (*Crystal lattice defects, Aluminum), Stresses, Cold working, Strain (Mechanics)

The flow-stress recovery of high-purity aluminum following a 10 pct tensile prestrain was studied in terms of a fractional flow-stress recovery parameter f sub r. The flow-stress recovery behavior was related to the dislocation arrangements using transmission electron microscopy. During recovery at 120 and 160 C, nearly stable strength levels were attained, the strength level for 120 C recovery being greater than that for 160 C. This stabilization of flow stress was related to the formation of metastable dislocation networks bounding nearly perfect cells. Both network formation and the annealing of dislocation loops were found to be recovery mechanisms, and the stronger metastable strength level for 120 C recovery was related to a smaller average cell size. Analysis of the networks was consistent with the reaction of sets of dislocations with a/2 (110) Burgers vector to give product Burgers vectors of either a/2 (110) or a (100). (Author)

AD-622 249 Div. 17/2 ,17/7
CFSTI Prices: HC $2.00 MF $0.50
IIT RESEARCH INST CHICAGO ILL
A STUDY OF THE HAFNIUM-OXYGEN SYSTEM.
Interim rept. for May 62-Apr 64,
by Robert F. Domagala, and Robert Ruh. Jul 65, 40p. Contract AF33 616 7074 Proj. 7022 Task 702206
ARL , 65-138
Unclassified report

Descriptors: (*Hafnium alloys, Phase studies), Hafnium, Hafnium compounds, Oxides, Transition temperature, Transformations, Hardness, Microstructure, Heat treatment, X-ray diffraction analysis, Ceramic materials

A study of annealed and quenched specimens of arcmelted alloys permitted the construction of the binary diagram from Hf to HfO2 and from 700 to 2500C. The diagram is characterized by the following features. (1) Additions of oxygen to Hf raise the alpha-beta (hcp-bcc) transformation temperature (1775 = 25C) resulting in a peritectic

reaction L (about 1 a/o O) + alpha (about 8 a/o O) yields beta (about 3 a/o O) at about 2250C. (2) The alpha phase has a broad solubility for oxygen. The maximum solubility has been positioned at 22 a/o O, decreasing to 20 a/o from 2000C. The alpha phase is stabilized to its melting point, 2500C. (3) A eutectic exists where L (about 37 a/o O) yields alpha (about 22 a/o O) + HfO2 at about 2200C. (4) HfO2 has a limited homogeneity range extending from about 66 to 66.7 a/o O. No metallographic evidence of the monoclinic-tetragonal inversion in HfO2 was noted. (5) The lattice parameters of specimens annealed at 1000C indicate a solubility limit for oxygen in alpha at 18.6 a/o, in reasonably good agreement with metallographically determined boundary. (Author)

AD-622 265 Div. 17/2 ,25/6
PITMAN-DUNN RESEARCH LABS FRANKFORD ARSENAL PHILADELPHIA PA
A KINETIC THEORY OF NUCLEATION IN DILUTE SOLID SOLUTIONS; APPLICATION TO THE PRECIPITATION OF CARBON AND NITROGEN IN ALPHA-IRON,
Revised ed.,
by Arthur C. Damask, C. C. Danielson, and G. J. Dienes. 3 Feb 65, 22p. Rept. no. A65-7
Proj. DA1C014501B11A

Unclassified report

Pub. in Acta Metallurgica v13 p973-89 Sep 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 30 Nov 64.

Descriptors: (*Solid solutions, Iron), (*Nucleation, Solid solutions), (*Iron, Solid solutions), Iron alloys, Carbon, Nitrogen, Solid state physics, Particle size, Kinetic theory, Impurities, Phase studies

A kinetic theory of nucleation and growth of precipitate particles in solid solutions is derived. This theory, which is applicable at low solute concentration and rather low solute-solute binding energy is obtained by application of equilibrium conditions to the reversible chemical rate equations of cluster formation. The equilibrium approximation permits sufficient cancellation of terms in the equations so that the remaining equations are integrable. Computer solutions for a variety of parameters of the kinetic equations were used to check the range of validity of the approximation necessary to obtain the analytic expression. The analytic expression describes the experimentally observed time dependence of the precipitation of carbon and nitrogen in alpha-iron. The analytic theory also predicts an average binding energy of precipitate atoms in a cluster which is in reasonable agreement with experimentally derived carbon-carbon and nitrogen-nitrogen binding energies in iron. The size of the fundamental precipitate nucleus, as well as the distribution of sizes of precipitate particles, is also predicted, but no experiments exist to check these predictions. (Author)

AD-622 280 Div. 17/2 ,14/7 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND MD
EFFECT OF PAINT VAPORS ON CADMIUM PLATED STEEL.
Final rept.,
by William H. Deaver. 1 Oct 65, 13p. Rept. no. CCL-187
Proj. 1C024401A329

Unclassified report

Descriptors: (*Corrosion, Cadmium), (*Cadmium, Corrosion), (*Plastic paints, Corrosion inhibition), (*Steel, Plating), Corrosive gases, Vapors, Polyester plastics, Epoxy plastics, Vinyl plastics, Composite materials, Nitrocellulose, Aging (Materials)

Studies to determine the cause of cadmium corrosion encountered in electronic vans showed the curing of alkyd resin enamels in a closed system can create an atmosphere corrosive to cadmium plated steel. Proper curing and ventilation should prevent this occurrence. It is also possible that the incorporation of some acid reactive pigment, such as zinc oxide, in alkyd enamels would also eliminate this type corrosion. Investigation of nine additional coatings representing different types of coating vehicles indicated that epoxy, vinyl, nitrocellulose-alkyd and nitrocellulose-acrylic vehicles will not create this corrosive atmosphere. (Author)

AD-621 778 See Fld. 21/4

AD-621 784 See Fld. 13/8

AD-621 788 See Fld. 14/2

AD-621 859 See Fld. 20/12

AD-621 867 See Fld. 18/9

AD-621 895 See Fld. 20/6

AD-622 190 See Fld. 20/13

AD-622 191 See Fld. 20/13

AD-622 227 See Fld. 20/13

AD-622 275 See Fld. 7/2

11/7. MISCELLANEOUS MATERIALS

AD-621 876 Div. 14/6 ,14/8
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
FILLED POLYMERS. PART V. INCORPORATION OF AMINATED BENTONITE IN POLYCAPROLACTAM,
by I. A. Uskov, T. A. Kusnitsyna, T. P. Kozlova, and V. P. Solomko. 21 Mar 62, 2p. Rept. no. AID-62-34
TT , 62-24490

Unclassified report

Trans. of Vysokomolekulyarnye Soedineniya (USSR) v4 n1 p95-7 1962.

Descriptors: (*Plastics, Composite materials), (*Composite materials, Plastics), (*Minerals, Reinforcing materials), Plastics, Polymers, Additives, Mechanical properties, Powders, Hardness, USSR

Aminated bentonite proved to be an active filler in polycaprolactam. The degree of amination effects hardness: the hardness is higher, if under- or overaminated bentonites are used. The explanation offered is that a certain degree of polarity is necessary for maximum development of the filler's activity. (Extracted)

AD-622 071 Div. 14/6 ,31/4
CFSTI Prices: HC $1.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
HYDROSTATIC, CREEP, AND CYCLIC TESTS OF RADIALLY ORIENTED GLASS-FIBER REINFORCED PLASTIC SPHERES.
Rept. for Feb-Jul 65,
by William P. Couch. Sep 65, 15p. Rept. no. 2089
Proj. S F013 05 03 Task 1025

Unclassified report

Descriptors: (*Composite materials, Submarine hulls), (*Plastics, Reinforcing materials), (*Submarine hulls, Plastics), (*Glass textiles, Reinforcing materials), Spheres, Hydrostatic pressure, Tests, Creep, Fatigue (Mechanics), Failure (Mechanics), High-pressure research, Buckling

A technique was developed in which glass-reinforced plastic spheres can be fabricated with the fibers oriented in the radial direction. The David Taylor Model Basin tested two 3-in.-diameter spheres of such construction and obtained very encouraging results. The two spheres tested had a weight to displacement ratio of 0.50 and a collapse pressure of at least 25,000 psi. A maximum stress of 165,000 was developed in the spheres prior to failure. Failure most likely occurred by elastic buckling. A 5-hr creep test conducted at a pressure comparable to a depth of 20,000 ft which generated a stress level of 57,500 psi indicated that creep was not severe. A cyclic test of 5000 times to a depth of 20,000 ft resulted in no apparent reduction in structural integrity. (Author)

AD-622 084 Div. 14/6 ,31/4
CFSTI Prices: HC $4.00 MF $1.00
NARMCO RESEARCH AND DEVELOPMENT DIV WHITTAKER CORP SAN DIEGO CALIF
INTERLAMINAR SHEAR OF FILAMENT-WOUND REINFORCED PLASTICS.
Final rept. for 28 Jun 63-30 Jun 65,
by Jim C. Keogh,Jr.. 15 Jul 65, 126p. Contract N60921 7094

Unclassified report

See also AD-613 997.

Descriptors: (*Composite materials, Filament wound construction), (*Filament wound construction, Composite materials), (*Submarine hulls, Filament wound construction), (*Plastics, Filament wound construction), Shear stresses, Glass textiles, Reinforcing materials, Epoxy plastics, Winding, Cylindrical bodies, Rings

Chemical and/or mechanical means of improving interlaminar shear within glass fiber, filament-wound plastic elements were investigated. One of the newer epoxy resins (ERLA-0400), used in the screening studies, exhibited interlaminar shear strengths in excess of 15,000 psi. The most significant advancement occurred in the mechanical improvement of interlaminar shear by means of fibers overwound helically onto basic structural elements. In addition, overwinding reduces physical property deviations and alters the stress-strain curve from a brittle failure to a nearly ductile mode. In addition to testing of the basic structural elements, triplaner winding was evaluated on thick-wall cylinders. The test articles were composed of overwound rings and were tested compressively in the uniaxial (circumferential) mode. Results indicated that overwinding increases both ultimate compressive strength and fatigue resistance. Also, a ring-stiffened cylinder was designed and fabricated, utilizing overwound elements. This unit was tested by a biaxial, hydrostatic compressive load. Failure occurred at 10,500 psig (ocean depth equivalent: 23,600 ft).

AD-622 118 Div. 14/6 ,27/3 ,31/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
FILAMENT-WINDING PLASTICS. PART 3. SOME EFFECTS OF CURING AGENT STRUCTURE UPON EPOXIDE PLASTIC PHYSICAL PROPERTIES.
Interim rept.,
by J. R. Griffith. 13 Sep 65, 15p. Rept. no. NRL-6313
Proj. SPO WWO41

Unclassified report

See also AD-609 770.

Descriptors: (*Filament wound construction, Composite materials), (*Composite materials, Filament wound construction), (*Epoxy plastics, Filament would construction), Glass textiles, Reinforcing materials, Aging (Materials), Amines, Aromatic compounds, Plastics, Rocket cases, Submarine hulls, Compressive properties, Tensile properties, Aliphatic compounds, Molecular structure, Winding

Plastics studies have attempted to relate the molecular structural characteristics of epoxide resins to tensile properties of the plastics obtained, with particular attention devoted to resin systems suitable for filament-winding applications. Recent work has been concerned with finding an amine curing agent which gives optimum properties to the epoxy component. Basic requirements are that it be a liquid or low-melting solid or be soluble in the epoxide and that the reaction rate between the epoxide and the curing agent be slow enough to permit proper winding. Because of their slower reaction rate with epoxides, aromatic amines have been found preferable to aliphatic or alicyclic ones. Except in the case of m-aminobenzyl amine, physical properties of the system are not improved by extension of aliphatic side chains from the phenyl ring of the curing agents, and tensile properties of the plastic are diminished as the number of methylene groups increases. Of the combinations studied, one of the most suitable resins for wet winding is the system of m-aminobenzyl amine and the diglycidyl ether of Bisphenol A, because of its high elongation. The cis-trans bis (2,3-epoxy cyclopentyl) ether/maminobenzyl amine system is probably the strongest plastic available for wet winding. (Author)

AD-621 779 See Fld. 13/8

AD-621 845 See Fld. 7/4

AD-621 920 See Fld. 11/2

AD-622 280 See Fld. 11/6

11/8. OILS, LUBRICANTS, AND HYDRAULIC FLUIDS

AD-621 774 Div. 14/5
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
TREATMENT OF HYDROCARBON LUBRICATING OIL BY SODIUM ALLOYS,
by A. F. Sirianni, W. A. Alexander, and I. E.Puddington. 8 Oct 64, 3p. Rept. no. NRC-8583
Unclassified report

Pub. in The Canadian Journal of Chemical Engineering v43 p191-2 Aug 1965 (Copies available only to DDC users).

Descriptors: (*Lubricant additives, Sodium alloys), (*Sodium alloys, Lubricant additives), Buffers (Chemistry), pH, Optical properties, Lubricants, Hydrocarbons, Processing, Canada

Sodium extended in the form of alloys with inert metals indicates marked acid neutralizing properties for hydrocarbon lubricating oil when the systems contain at least 20 atom percent sodium. Transparency of the treated oil correlated well with pH measurements. (Author)

AD-621 797 Div. 14/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
CHEMISTRY AND TECHNOLOGY OF FUELS AND LUBRICANTS (SELECTED ARTICLES).
15 Sep 65, 23p. Rept. no. FTD-TT-65-704
TT , 65-64050
Unclassified report

Unedited rough draft trans. of Khimiya i Tekhnologiya Topliv i Masel (USSR) v9 n8 p50-3, 60-5 1964.

Descriptors: (*Siloxanes, Additives), (*Lubricant additives, Phenols), (*Phenols, Antioxidants), (*Antioxidants, Chromatographic analysis), Oils, USSR, Amines, Lubricants

Contents: Action of additives on wear-resistance and anti-friction properties of polysiloxane compounds, by M. I. Nosov and G. V. Vinogradov; Determination of antioxidant additives in oils by the thin-layer chromatographic method, by N. D. Zubkova, Yu. I. Turskii, V. I. Genkina, G. V. Klyuchko.

AD-621 820 Div. 14/5
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
LUBRICATING PROPERTIES OF SOLUTIONS OF ORGANIC ACIDS IN HYDROCARBONS,
by G. I. Fuks. 27 Apr 62, 4p. Rept. no. AID-62-48
TT , 65-64069
Unclassified report

Trans. of mono. Issledovaniya v Oblasti Poverknostnykh Sil: Sbornik Dokladov na Konferentsii po Poverkhnostnym Silam, Moscow, 1960, pub. 1961 p99-112.

Descriptors: (*Lubricants, Boundary layer), (*Instrument greases, Boundary layer), (*Fatty acids, Lubricants), Hydrocarbons, Solutions, Statics, Molecular structure, Thermal properties, Compressive properties, Shear stresses, Friction, Thickness, USSR

The study was initiated to define the properties of boundary layers of solutions of organic acids in liquid hydrocarbons formed between two solids. An attempt is made to determine the relationship of the static properties of such boundary layers to the structure, composition, and concentration of the acids and to the composition of the solvents and the solids. Attention is also given to the effect of temperature increases on the boundary layer.

AD-621 916 Div. 14/5 ,1/9
CFSTI Prices: HC $1.00 MF $0.50
SHELL OIL CO WOOD RIVER ILL RESEARCH LAB
STUDY OF HELICOPER GEAR LUBRICATION.
Quarterly progress rept. no. 2, Jun-Aug 65,
by D. R. Bailey, S. J. Beaubien, J. E. Bevel, and D. E. Stuart. Aug 65, 23p. Contract NOw65 0323c
Unclassified report

See also AD-618 522.

Descriptors: (*Helicopters, Gears), (*Lubrication, Gears), (*Gears, Lubrication), Coatings, Tests, Loading (Mechanics), Fatigue (Mechanics), Life expectancy, Failure (Mechanics), Lubricants

Studies of the effect of gear-tooth surface pretreatments on gear performance were continued. Two surface precoatings, one obtained with Parco Lubrite solution and one with trichloroacetic acid, were found to increase greatly the constant load gear fatigue life, the former consistently, and the latter under some conditions of operation. A 30% reduction in load with the untreated gears was necessary in order to achieve the same constant load life as obtained with Parco Lubritetreated gears at 6400 rpm. In other experiments, improvement of the surface finish by lapping resulted in improvements in gear life of about two to four times that of the untreated gears, the greater improvement being at low speed. None of the pretreatments significantly affected the score load of a MIL-L-23699 oil. In break-in studies employing a loading schedule in which the load was increased stepwise, it was found that neither operation for a long prior period at low load nor elimination of the low-load steps had any significant effect on the eventual failure load, or the mode of failure. In tests with a synthetic base oil on the Rotary Contact Simulator, in which various points on the gear tooth profile were simulated, immediate scoring occurred on the disks simulating the tips, and areas near the tips, of the pinion and gear addenda. In every case of scoring, the mating disks, representing the corresponding dedenda, had undergone considerable surface cracking and sometimes pitting. Between these extremities on the gear-tooth active profile no failures occurred. (Author)

AD-621 884 See Fld. 21/9

AD-621 885 See Fld. 21/4

11/9. PLASTICS

AD-621 767 Div. 14/8 ,4/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
SOME SOLUTION PROPERTIES OF POLY ALPHAMETHYLSTYRENES OF LOW MOLECULAR WEIGHT,
by B. J. Cottam, J. M. G. Cowie, and S. Bywater.
27 Nov 64, 10p. Rept. no. NRC-8588
Unclassified report

Pub. in die Makromolekulare Chemie v86 p116-23 1965 (Copies available only to DDC users).

Descriptors: (*Styrene plastics, Solutions), Molecular weight, Viscosity, Heat of solution, Organic solvents, Phase studies, Canada

Fractions of poly-alpha-methylstyrene of molecular weights below 15,000 were prepared. Measurements of molecular weight, intrinsic viscosity and heats of solution were made in cyclohexane, toluene, and tetrahydrofuran. The results were applied to the correction of heats of polymerization, for phase change and heats of solution. (Author)

AD-621 876 See Fld. 11/7

11/10. RUBBERS

AD-622 237 Div. 14/9
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
DEVELOPMENT OF THE RUBBER INDUSTRY IN THE USSR 1950-1960: COMPREHENSIVE REPORT, PART I.
20 Apr 64, 67p. Rept. no. AID-U-64-26
TT , 65-64125
Unclassified report

Descriptors: (*Rubber, USSR), Industries, Synthetic rubber, Manufacturing methods, Industrial plants

RUBBER INDUSTRY IN THE USSR: Imports, outputs, synthetic rubbers, latices, synthetic rubber plants, rubber product plants and auxiliary industries, rubber research and its application in industry. THE SEVENYEAR PLAN.

12/1. MATHEMATICS AND STATISTICS

AD-621 641 Div. 15/1
ILLINOIS UNIV URBANA
BOUNDED APPROXIMATION BY POLYNOMIALS,
by L. A. Rubel, and A. L. Shields. 28 Sep 63,

21p. Contract AF AFOSR460 63 Proj. 9749 Task 974902
AFOSR , 65-1410

Unclassified report

Pub. in Acta Mathematica v112 p145-62 Dec 2 1964 (Copies available only to DDC users). Prepared in cooperation with Columbia Univ., New York, and Michigan Univ., Ann Arbor.

Descriptors: (*Functional analysis, Polynomials), (*Polynomials, Functional analysis), Sequences, Complex variables, Numerical analysis, Theorems

This paper presents a complete solution to the following problem: if G is an arbitrary bounded open set in the complex plane, characterize those functions in G that can be obtained as the bounded pointwise limits of polynomials in G. Roughly speaking, the answer is that a function is such a limit if and only if it has a bounded analytic continuation throughout a certain bounded open set G* that contains G. This set G* is the inside of the 'outer boundary' of G. More precisely, if G is a bounded open set and if H is the unbounded component of the complement of G- (the closure of G), then G* denotes the complement of H-.

AD-621 663 Div. 15/1
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF MATHEMATICS
PERIODIC SOLUTIONS FOR DIFFERENTIAL SYSTEMS WITH SYMMETRIES.
Revised ed.,
by J. H. Heinbockel, and Raimond A. Struble. 10 Nov 64, 16p.
AROD , 4105:8

Unclassified report

Pub. in J. Soc. Indust. Appl. Math. v13 n2 p425-40 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 7 Aug 64.

Descriptors: (*Differential equations, Theorems), Dynamics, Functional analysis, Nonlinear systems, Vibration, Trajectories

A simple theorem is obtained on the existence of periodic solutions of differential systems possessing certain symmetry properties. The theorem is very general and describes periodic solutions for both autonomous and nonautonomous systems.

AD-621 680 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
MITRE CORP BEDFORD MASS
THE REDUCTION OF THE VARIANCE BY LEAST SQUARES POLYNOMIAL APPROXIMATION,
by H. C. Joksch. Sep 65, 24p. Rept. no. RM-03967
Contract AF19 628 2390 Proj. 7070
ESD , TR-65-369

Unclassified report

Descriptors: (*Least squares method, Analysis of variance), (*Least squares method, Analysis of variance), (*Polynomials, Least squares method), Numerical analysis

Least squares approximations obtain parameters with a variance lower than those of the data from which they are obtained. A least squares polynomial approximation to observations may be used to obtain 'smoothed' values of the observations or to make predictions. The reduction of the variance achieved by this process is determined for several special cases. Some properties of the Gram-polynomials necessary for the analysis are derived. (Author)

AD-621 733 Div. 15/1 ,9/1
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF MATHEMATICS
INSTABILITY, UNIQUENESS, AND NONEXISTENCE THEOREMS FOR THE EQUATION UT-=UXX-UXTX ON A STRIP,
by Bernard D. Coleman, Richard J. Duffin, and Victor J. Mizel. 13 Nov 64, 18p. Contract DA ARO D31 124G78 ,NSF GP2118
AROD , 223:64

Unclassified report

Pub. in Archive for Rational Mechanics and Analysis v19 n2 p100-16 1965 (Copies available only to DDC users). Prepared in cooperation with Melon Inst., Pittsburgh, Pa.

Descriptors: (*Theorems, Partial differential equations), (*Partial differential equations, Theorems), (*Boundary value problems, Incompressible flow), Stability, Potential theory, Fluid mechanics

AD-621 795 Div. 15/1 ,30/2 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ON THE EXPANSION OF A CIRCLE OF PROBLEMS, SOLVED WITH THE AID OF SMALL SCALE DIGITAL MACHINES,
by V. I. Gorushkin, A. A. Krumin, and T. S. Latysheva. 14 Sep 65, 9p. Rept. no. FTD-TT-65-1228
TT , 65-64052

Unclassified report

Unedited rough draft trans. of Elektrichestvo (USSR) n7 p28-9 1962.

Descriptors: (*Numeric analysis, Programming (Computers), (*Digital computers, Numerical analysis), Electrical engineering, USSR

AD-621 863 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF MATHEMATICS
LOGARITHMIC DIFFERENTIAL FIELDS, AND PRINCIPAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS.
Terminal rept. for 17 Mar 59-31 May 60,
by Walter Strodt, and Harish-Chandra. 14 Nov 60, 13p. Contract AF49 638 644
AFOSR , TR-60-173

Unclassified report

Descriptors: (*Differential equations, Theory), Algebra, Complex variables, Numerical analysis

AD-621 864 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
CONSERVATIVE TOLERANCE AND CONFIDENCE LIMITS.
Research rept.,
by Richard E. Barlow. Sep 65, 24p. Rept. no. ORC-65-30
Contract Nonr365618 ,DA31 124ARO D331 Proj. NR042 238

Unclassified report

Descriptors: (*Statistical analysis, Life expectancy), Reliability, Failure (Mechanics), Operations research, Hazards

This paper extends the validity of exponential tolerance and confidence limits, under certain restrictions, to the class of distributions with monotone failure rate. In particular, the usual exponential lower tolerance limit is shown to be conservative for the increasing failure rate class of distributions in the range of population coverages and confidence coefficients of practical interest. Conservative confidence limits are also obtained on tail probabilities and moments. (Author)

AD-621 869 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ON ANALOGUES OF POINCARE-LYAPUNOV THEORY FOR MULTIPOINT BOUNDARY-VALUE PROBLEMS,
by Richard Bellman. Sep 65, 17p. Rept. no. RM-4717-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Boundary value problems, Control), (*Control, Theory), Partial differential equations, Stability, Vector analysis, Integral equations

A study of control theory and of its application to the guidance of mechanical, electronic, economic, and other processes. The solution of a number of its deterministic problems requires the minimization of a certain functional. The memorandum considers the behavior of such solutions as the duration of control becomes infinite. (Author)

AD-621 906 Div. 15/2 ,25/1
CFSTI Prices: HC $3.00 MF $0.50
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
TESTS FOR RANDOMNESS, STATIONARITY, NORMALITY AND COMPARISON OF SPECTRA.
Final rept. for Feb 64-Apr 65,
by Julius S. Bendat, Loren D. Enochson, and Allan G. Piersol. Aug 65, 54p. Rept. no. MAC-402-03A
Contract AF33 615 1314 Proj. 4437 Task 443706
DL , TR-65-74

Unclassified report

Descriptors: (*Statistical tests, Data), Vibration, Probability, Correlation techniques, Acoustics

This report contains material for carrying out certain practical tests for randomness, stationarity, and normality of physical data, as well as details on how to test for equivalence of two power spectral density functions. The tests for randomness are qualitative inspections of measured properties from sample records, such as power spectra, probability density, auto-correlation functions, which may be part of a regular data reduction procedure. The tests for stationarity are nonparametric statistical procedures, based upon Run and Trend Distributions, which require simple quantitative calculations for acceptance or rejection. The test for normality is a statistical hypothesis test based upon sample measurements of the amplitude probability density function at seven equispaced amplitude levels from zero to plus and minus three sigma. To test for equivalence of two spectra, a straight-forward procedure is recommended which requires knowledge only of the number of degrees-of-freedom associated with the spectral estimates, and the full bandwidth occupied by the data. A special case of this procedure is to compare an unknown spectrum to a 'white' spectrum. (Author)

AD-621 907 Div. 15/2 ,30/2 ,25/1
CFSTI Prices: HC $2.00 MF $0.50
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
PROBABILITY CALCULATIONS ON A DIGITAL COMPUTER.
Technical rept. for Feb 64-Apr 65,
by Robert K. Otnes. Aug 65, 34p. Rept. no. MAC-402-07
Contract AF33 615 1314 Proj. 4437 Task 443706
FDL , TR-65-75

Unclassified report

Descriptors: (*Probability, Programming (Computers)), (*Digital computers, Programming (Computers)), Statistical tests, Statistical data, Vibration, Acoustics

The purpose of this report is to discuss computer implementations of tests for normality. Some of

the underlying statistical considerations and random process theory are briefly reviewed to provide a background for subsequent material. Methods for digitally computing basic statistical parameters, such as the mean variance, skewness, kurtosis, etc., are given, along with procedures for computing the sample probability density function. Problems arising from the digital and discrete nature of the data are discussed, as well as sample sizes required for for the tests. The central part of the report consists of a detailed discussion of the computer implementation of the chi-square goodness-of-fit test as applied to testing for normality, followed by computer program flow charts, suitable for use in coding the procedure for a digital computer. Sufficient detail has been provided so that a programmer unfamiliar with the material should be able to write a program which will make maximum use of the time which is frequently lost during periods of input and output of data from the computer. The report concludes with an appendix which lists standard approximations for some of the mathematical functions required in the calculations. (Author)

AD-621 931 Div. 15/1 ,9/1
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
GENERALIZED ORTHOGONAL POLYNOMIAL SOLUTIONS OF THE BOLTZMANN EQUATION,
by David Mintzer. 16 Sep 64, 15p.
Unclassified report

Pub. in The Physics of Fluids v8 n6 p1076-90 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Polynomials, Differential equations), (*Differential equations, Polynomials), Statistical functions, Integral equations, Fluid mechanics

AD-621 971 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
SYSTEMATIC METHODS TO CALCULATE FACTOR EFFECTS AND FITTED VALUES FOR A 2N3M FACTORIAL EXPERIMENT,
by Barry Margolin. Jun 65, 14p. Rept. no. ECOM-2621
Proj. 1C6 22001A053 Task 1C6 22001A053 01
Unclassified report

Descriptors: (*Combinatorial analysis, Factor analysis), (*Factor analysis, Combinatorial analysis), Curve fitting, Least squares method

Two systematic procedures to facilitate the analysis of a 2n3m factorial experiment are presented. These methods are applicable when all the three-level factors are both quantitative and equally spaced. The first algorithm systematizes the calculation of the factor effects for the 2n3m series. The second procedure yields the set of fitted values, and consequently the residuals, based on those factor effects which have been judged to be significantly different from zero. For the case m = 0, the first algorithm reduces to the standard forward Yates procedure for the 2n series; similarly, when n = 0, this algorithm reduces to the forward Yates procedure for the 3m series. When m = 0, the second algorithm reduces to a simple variation of the 'forward Yates' for the 2n series. (Author)

AD-621 978 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
INFORMATION SYSTEMS LAB UNIV OF MICHIGAN ANN ARBOR
A STUDY OF A MODEL FOR PARALLEL COMPUTATION.
Technical rept.,
by Raymond Reiter. Jul 65, 34p. Rept. no. ISL-65-4 ,06920-4-T
Contract AF30 602 3546
Unclassified report

Descriptors: (*Numerical methods + procedures, Mathematical models), (*Graphics, Iterative methods), Queueing theory, Optimization, Sequences

A generalization is given of a model for parallel computation as formulated by Karp and Miller (R. M. Karp and R. E. Miller. Properties of a model for parallel computations: determinacy termination, queueing. IBM Research Paper RC-1285). A parallel computation is viewed as a directed graph in which a node represents a sequence of operations to be performed upon data on the node input branches with the results of an operation being placed upon the output branches. An operation associated with a node n may initiate if and only if, for each input branch d to n, the data queue length on d is greater than, or equal to, some threshold T. It is shown that a unique computation is defined independently of the timing of the node operations. Methods are derived for determining whether a computation terminates and for finding the number of performances of each node computation step involved. In particular, an algorithm is given which yields the number of performances of each node computation step for the set of terminating nodes of a computation graph. Necessary and sufficient conditions for data queue lengths to remain bounded are derived. (Author)

AD-621 980 Div. 15/1
WESTERN RESERVE UNIV CLEVELAND OHIO DEPT OF MATHEMATICS
ON THE ZEROS OF SOLUTIONS OF A SECOND-ORDER LINEAR DIFFERENTIAL EQUATION,
by Walter Leighton. 20 Jan 65, 16p. Contract DA ARO D31 124G600
AROD , 2828:9
Unclassified report

Pub. in Journal de Mathematiques v44 n3 p297-310 1965 (Copies available only to DDC users).

Descriptors: (*Differential equations, Numbers), Number theory, Functions, Calculus of variations

AD-621 991 Div. 15/1 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
RESEARCH ANALYSIS CORP MCLEAN VA
COMPUTER PROGRAM IMPLEMENTING THE SEQUENTIAL UNCONSTRAINED MINIMIZATION TECHNIQUE FOR NONLINEAR PROGRAMMING.
Technical paper,
by Garth P. McCormick, W. Charles Mylander III, and Anthony V. Fiacco. Apr 65, 92p. Rept. no. RAC-TP-151
Unclassified report

See also AD-423 903.

Descriptors: (*Nonlinear programming, Programming (Computers)), (*Programming (Computers), Nonlinear programming), Vector analysis, Numerical methods + procedures, Optimization, Calculus of variations, Transformations (Mathematics)

The mathematical programming problem-minimize f (x) subject to R sub j (x)> or = 0 for j = 1, ..., m, where f and the R sub j's may be nonlinear-is solved by solving a sequence of unconstrained minimization problems. Upper and lower bounds on the optimal solution value, primal and dual feasible points, and estimates of the optimal solution values are generated after each iteration. The program is coded in FORTRAN IV. (Author)

AD-621 997 Div. 15/1 ,15/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
A GRADIENT TECHNIQUE OF ADAPTIVE MONTE CARLO.
Professional paper,
by E. L. Pugh. 8 Sep 65, 25p. Rept. no. SP-1921/000/01
Unclassified report

Descriptors: (*Monte Carlo method, Stochastic processes), (*Stochastic processes, Sampling), Analysis of variance, Probability, Machines, Reliability

A technique of Monte Carlo estimation is presented which is 'adaptive' in the sense that its efficiency increases as the sampling proceeds. It is based on sequentially estimating the gradient of the variance and following the path of steepest descent. The technique is applied to a problem of estimating the survival probability of a repairable machine. (Author)

AD-622 005 Div. 15/1 ,30/2 ,26/6
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE CONDENSED MATRIX METHOD.
Professional paper,
by John Staudhammer. 17 Aug 65, 19p. Rept. no. SP-2174/000/00
Unclassified report

Descriptors: (*Matrix algebra, Programming (Computers)), (*Mechanics, Matrix algebra), Gears, Vibration, Torque, Dynamics, Data storage systems

A method for compacting the shifted matrix technique is presented for the calculation of state vectors in mechanical systems. The method allows a saving in computer memory space of 75% compared to direct matrix analysis. The method is illustrated with examples involving rotational vibrations of elastic gear trains, including a branched gear train. The method leads to a particularly simple algorithm applicable to desk calculations as well. (Author)

AD-622 027 Div. 15/2 ,18/7
CFSTI Prices: HC $4.00 MF $1.00
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
APPLICATIONS OF STOCHASTIC COMPETITION PROCESSES TO WEAPON SYSTEM SURVIVAL.
Doctoral thesis,
by Joseph J. Schoderbek. Mar 64, 146p. Rept. no. 6-74-64-3
Unclassified report

Technical rept. on mathematics.

Descriptors: (*Stochastic processes, Weapon systems), (*Weapon systems, Stochastic processes), Systems engineering, Kill probability, Optimization, Military strategy, Warfare

AD-622 028 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
NAVY UNDERWATER SOUND LAB NEW LONDON CONN
LEAST SQUARES LINEAR FITS TO DATA.
Research rept.,
by Edward S. Eby. 4 Oct 65, 11p. Rept. no. USL-687
Proj. 1 410 00 00
Unclassified report

Descriptors: (*Least squares method, Curve fitting), (*Curve fitting, Least squares method), Errors, Equations

The standard method of determining the line of best fit under the least square error criterion gives different results depending on which variable is selected as the dependent variable. In the case in which all variables are subject to error rather than only the dependent variable, this situation is clearly unsatisfactory. This report presents a method of determining linear fits when all variables are subject to error. (Author)

AD-622 029 Div. 15/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
SEQUENTIAL TESTING WHEN ONLY THE ALTERNATIVE HYPOTHESIS IS COMPOSITE.
Master's thesis,
by Eugene Simatis. Jun 65, 62p. Rept. no. GRE/MATH/64-10

Unclassified report

Descriptors: (*Sequential analysis, Statistical tests), (*Statistical tests, Sequential analysis), Decision theory

This thesis is a discussion of sequential analysis when the alternative hypothesis is composite. Sequential testing with composite alternatives is introduced through decision theory and sequential tests of simple hypotheses. The weighted average and maximum methods are presented as solutions to the problem of testing with composite alternatives. The existence of optimum weight functions in some special but important cases is shown. A procedure is demonstrated for constructing a sequential test when one critical point in the statement of the alternative hypothesis is given. The procedure is illustrated by two examples involving one- and two-parameter distributions. (Author)

AD-622 037 Div. 15/1 MF $0.50
BIRMINGHAM UNIV (ENGLAND)
SIMPLICIAL METHODS FOR QUADRATIC PROGRAMMING,
by C. van de Panne, and Andrew Whinston. 1964, 33p.

Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n4 p273302 Dec 1964. Available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.50 in D210.14:11/4.

Descriptors: (*Quadratic programming, Numerical methods + procedures), (*Numerical methods + procedures, Quadratic programming), Linear programming, Operations research

The article is concerned with two closely related quadratic programming methods, the Simplex and the dual method for quadratic programming. Though a self-contained exposition of both methods is given, the article is concentrated on proofs of convergence of these methods and the properties of the Simplex tableaux. (Author)

AD-622 044 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
MITRE CORP BEDFORD MASS
PROGRAMMING WITH FRACTIONAL LINEAR OBJECTIVE FUNCTIONS,
by H. C. Joksch. 1964, 9p. Contract AF19 628 2390

Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n2 and 3 p197-204 Jun-Sep 1964. Presented at the Joint CORS-ORSA Meeting at Montreal, 28 May 1964.

Descriptors: (*Linear programming, Optimization), Functions, Complex variables

Programming problems with linear constraints and certain objective functions containing fractions of linear functions are reduced to parametric linear programming problems by treating the value of one of the linear forms in the objective function as a parameter. Conditions for extrema are derived and the possibilities for local and global extrema are discussed. (Author)

AD-622 046 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV BALTIMORE MD
DECOMPOSITION OF LINEAR PROGRAMS BY DYNAMIC PROGRAMMING,
by George L. Nemhauser. 1964, 6p.

Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n 2 and 3 p191-95 Jun-Sep 1964.

Descriptors: (*Linear programming, Optimization), (*Dynamic programming, Linear programming), Recursive functions

The decomposition principle of Dantzig and Wolfe (Operations Research, 8:101-111 (1960)) is a method for breaking large linear programs with a block diagonal structure into a set of smaller subprograms. As alternative decomposition scheme derived from a dynamic programming approach is proposed here. This results in a series of parametric linear subprograms whose recursive solution yields the solution to the original linear program. (Author)

AD-622 070 Div. 15/1 ,25/3
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
DISCUSSION OF A NON-LINEAR DIFFERENTIAL EQUATION CONTAINING EXCEPTIONAL POINTS,
by Karl G. Guderley. Jul 65, 78p. Rept. no. ARL-65-141
Proj. 7071 Task 707103

Unclassified report

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Descriptors: (*Numerical analysis, Probes (Electromagnetic)), (*Nonlinear differential equations, Numerical Analysis), (*Probes (Electromagnetic), Theory), Plasma physics, Calculus of variations

A theoretical treatment of spherical plasma probes in the Vlassov approximation leads to a non-linear ordinary differential equation which has somewhat exceptional properties. Certain mathematical phenomena caused by this fact are studied in the present report. Within the region of integration, one encounters certain points for which a Lipschitz condition is not satisfied; fortunately, a weaker condition suffices to establish uniqueness of the initial value problem in the present case. Next, one asks whether the solutions of the variational equation are suited to approximate neighboring solutions for a given solution. Two cases are discussed where the variational equation will yield such an approximation. In a third case, the approximation fails in the vicinity of the exceptional point. Here an auxiliary approximation valid for this vicinity is introduced and the auxiliary solution is matched with the solution of the variational equation. The result is somewhat unexpected. Finally, the actual numerical procedure is discussed. No definite conclusion can be reached, but one recognizes which form of intermediate approximations may cause numerical difficulties. (Author)

AD-622 076 Div. 15/2 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
A DELAY DEPENDENT QUEUE DISCIPLINE,
by L. Kleinrock. 1964, 16p.

Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n4 p329-41 Dec 1964. Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50 in D210.14:11/4.

Descriptors: (*Queueing theory, Operations research), Time-lag theory, Systems engineering

Queue disciplines studied in the past have not given the system designer sufficient freedom with which to alter the relative waiting times of the various priority groups. In this paper, results are derived for a delay dependent priority system in which a unit's priority in increased, from zero, linearly with time in proportion to a rate assigned to the unit's priority group. The utility of this new priority structure is that it provides a number of degrees of freedom with which to manipulate the relative waiting times for each priority group. (Author)

AD-622 077 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
HYPERBOLIC PROGRAMMING,
by Bela Martos. 1964, 22p. Contract Nonr27T024
TT , 65-64093

Unclassified report

Trans. of Magyar Tudomanyos Akademia Matematikai Kutato Intezetenek Kozlemenyes (Hungary) v5 p383-406 1960.

Descriptors: (*Mathematical programming, Optimization), Linear programming, Scheduling, Economics, Hungary

This study discusses a special case of mathematical programming, namely, when the functions f sub 1 ... f sub m are linear and the function v is a linear fractional function. Since the graph of y = cx - c - sub o, dx - d sub o which is a one-variable linear fractional function, is hyperbolic on the (x,y) coordinate system, this is called a hyperbolic programming problem. It is shown that the problem of hyperbolic programming can be solved with the aid of a slightly modified simplex method.

AD-622 079 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
ON THE DIRECT SUM AND TENSOR PRODUCT OF MATRIX GAMES,
by Bertram Mond. 1964, 12p.

Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n2/3 Jun/Sep 1964.

Descriptors: (*Matrix algebra, Game theory), (*Tensor analysis, Matrix algebra), (*Linear programming, Game theory)

A direct sum and tensor product of matrix games and of their equivalent linear programs are defined. The relationship of a 'composed' game to the corresponding 'composed' linear program is derived. Conditions are obtained for the solution of the direct sum or tensor product game to be determined from the solutions of the component games. Examples are given to show how many actual conflicts can be represented by direct sum or tensor product games. (Author)

AD-622 081 Div. 15/1 ,12/1
CFSTI Prices: HC $4.00 MF $1.00
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
COMPUTATIONAL METHODS IN OPTIMAL CONTROL PROBLEMS.
Final rept. for May 64-May 65,
by James A. Payne. Aug 65, 132p. Rept. no. 65-8 pt. 1
Contract AF33 615 1794 Proj. 8225 Task 822501
FDL , TR-65-50

Unclassified report

Descriptors: (*Optimization, Flight control systems), (*Reentry vehicles, Atmosphere entry), (*Atmosphere entry, Mathematical models), Spacecraft, Calculus of variations, Trajectories, Numerical analysis

This report considers the application of optimization techniques to the development of methods for the control of engineering systems. The systems considered are those physical processes which are subject to independent control forces and in which the dynamics of the process are of central importance. It is assumed that the process can be described by a system of ordinary nonlinear differential equations. The optimization, with respect to a general criterion function, of such systems is considered. The conditions and equations which specify the optimal system behavior are derived by means of the Maximum Principle. System trajectories which satisfy the optimal conditions, i.e., optimal trajectories, can only be obtained by numerical computation. Various approaches to this computational problem are reviewed and their primary limitations are discussed. In order to provide a realistic evaluation of certain computational methods, the optimization of a particular engineering system is considered in detail. This system is a variable lift aerodynamic vehicle during the atmospheric reentry phase. A mathematical model for this system is developed and the optimization of this model is considered. The criterion function is a linear combination of the heating and acceleration effects which are experienced by the vehicle during the reentry phase.

AD-622 086 Div. 15/2
CFSTI Prices: HC $3.00 MF $0.75
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
RANDOM FATIGUE TEST SAMPLING REQUIREMENTS.
Final technical rept. for Feb 64-Apr 65,
by S. C. Choi, and L. D. Enochson. Aug 65, 76p.
Rept. no. MAC-402-02A
Contract AF33 615 1314 Proj. 4437 Task 443706
FDL , TR-65-95

Unclassified report

Descriptors: (*Fatigue (Mechanics), Statistical tests), (*Statistical tests, Fatigue (Mechanics)), (*Monte Carlo method, Fatigue (Mechanics)), Life expectancy, Sonic fatigue

Basic considerations are discussed for determining sample sizes and record lengths for various statistical tests and estimates which are important to random fatigue testing. Methods for determining minimum sample sizes when comparing means and variances of normally (Gaussian) distributed random variables are described. Procedures for reducing a relatively large sample to a smaller sample are presented. Elimination of outliers and systematic resampling are two methods given. An explanation is presented of the requirements and problems involved in the determination of record lengths necessary for an estimate of a given accuracy for autocorrelation functions, ordinary power spectral density functions, cross-correlation functions, cross-spectral density functions, frequency response functions, and probability density functions. Due to its importance in random fatigue testing applications, the basic properties of the Weibull distribution in terms of its parameters and the failure rate are summarized. A presentation is given of estimation and statistical testing problems related to the Weibull distribution. The best available methods of estimating the parameters are described. Methods of determining sample sizes needed for various analyses are developed. Some problems of reliability analysis applicable in fatigue testing are discussed. New methods of decision techniques for comparing two or more systems are proposed in terms of reliability. The report concludes with an example of the application of the Weibull distribution to actual fatigue test data. (Author)

AD-622 107 Div. 15/2
ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY
DETERMINATION OF SPECTRAL PROFILES FROM CORRELATION MEASUREMENTS.
by C. L. Mehta. 24 Aug 64, 5p.
AROD , 4965:11

Unclassified report

Pub. in Il Nuovo Cimento v36 (Ser10) p202-5 1965 (Copies available only to DDC users).

Descriptors: (*Correlation techniques, Integral transforms), (*Integral transforms, Correlation techniques), Complex variables, Functions

AD-622 257 Div. 15/2
CFSTI Prices: HC $3.00 MF $0.75
NORTH CAROLINA UNIV CHAPEL HILL
ESTIMATION OF THE PARAMETERS OF THE EXTREME VALUE DISTRIBUTION BY ORDER STATISTICS.
Technical rept.,
by Khatab M. Hassanein. 1964, 79p. Contract DA ARO D31 124G432 Proj. 2776M,DA-20014501B14C
AROD , 2776:17

Unclassified report

Descriptors: (*Statistical distributions, Statistical analysis), (*Statistical analysis, Statistical distributions), Sampling, Analysis of variance

An estimation of the parameters for the first type (or exponential type) of asymptotic distribution, this paper deals with (1) the best linear unbiased estimate for n < or = 6 (largest value) and the case of missing data, (2) the nearly best linear unbiased estimate for n < or = 25 (n = 1 (1) 10 (5) 25) with all possible cases of singly and doubly censored samples, and (3) estimating the percentage points. (Author)

AD-622 274 Div. 15/2
CFSTI Prices: HC $4.00 MF $0.75
C-E-I-R INC BEVERLY HILLS CALIF
ON NON-REGULAR ESTIMATION, MINIMUM VARIANCE BOUNDS AND THE PEARSON TYPE III DISTRIBUTION.
Final rept.,
by W. R. Blischke, A. M. Glinski, M. V. Johns,Jr., P. B. Mundle, and A. J. Truelove. Sep 65, 107p. Contract AF33 615 1062 Proj. 7071 Task 707101
ARL , 65-177

Unclassified report

Descriptors: (*Statistical distributions, Statistical analysis), Analysis of variance, Programming (Computers)

This project concerns general investigations on the theory of non-regular estimation and particular investigations leading to asymptotically efficient estimators for the parameters of the Pearson Type III distribution and also for other distributions, including Types I and V of the Pearson system, the Weibull distribution and a generalization of the gamma distribution. In all of these examples the difficulty is in estimating the location parameter. In each case for a non-trivial subset of the parameter space, standard techniques, including those derived specifically for the non-regular case, for determining a lower bound on the variance of an unbiased estimator result in an inequality which states that the variance of all such estimators is non-negative. New bounds, which yield uniformly non-trivial results, have been constructed. These have been applied to the above examples. Some suggestions for constructing estimators whose variance achieves at least the order of magnitude of these bounds are offered. (Author)

AD-621 657 See Fld. 20/4

AD-621 710 See Fld. 19/4

AD-621 750 See Fld. 9/2

AD-621 752 See Fld. 7/4

AD-621 783 See Fld. 20/13

AD-621 815 See Fld. 18/9

AD-621 836 See Fld. 9/2

AD-621 847 See Fld. 5/1

AD-621 848 See Fld. 6/16

AD-621 852 See Fld. 20/12

AD-621 890 See Fld. 15/5

AD-621 908 See Fld. 4/2

AD-621 910 See Fld. 5/1

AD-622 012 See Fld. 9/2

AD-622 016 See Fld. 9/2

AD-622 049 See Fld. 15/3

AD-622 074 See Fld. 15/5

AD-622 075 See Fld. 15/5

AD-622 078 See Fld. 15/5

AD-622 145 See Fld. 20/12

AD-622 250 See Fld. 5/1

AD-622 251 See Fld. 5/1

AD-622 276 See Fld. 20/8

13/1. AIR CONDITIONING, HEATING, LIGHTING, AND VENTILATING

AD-621 720 See Fld. 20/13

AD-621 845 See Fld. 7/4

AD-621 998 See Fld. 15/3

13/2. CIVIL ENGINEERING

AD-622 000 Div. 33/2 ,30/5
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
TRAFFIC FLOW DATA ACQUISITION USING MAGNETICLOOP VEHICLE DETECTORS.
Professional paper,
by Stan Stern. 19 Jul 65, 35p. Rept. no. SP-2101/000/00

Unclassified report

Descriptors: (*Vehicles, Traffic), (*Traffic, Measurement), (*Magnetometers, Vehicles), Passenger vehicles, Velocity, Magnetic fields, Simulation, Counting methods

One means of acquiring validation data for System Development Corporation's digital computer simulation of traffic flow in a freeway diamond interchange will be through the use of magnetic-loop vehicle detectors. Actual interchange performance will be monitored by direct measurement of vehicle parameters (count,size, and velocity), leading eventually, through the validation process, to a realistic simulation model. Techniques were developed to extend existing loop-detector capabilities, permitting direct measurement of vehicle parameters (measurements were available heretofore only on a statistical basis) and experiments were conducted to determine detector/sensor-loop response characteristics. A practical sensor-loop configuration, which was developed for the validation runs and tested in controlled experiments, provided an accurate picture of the over-all traffic pattern. Measurement accuracy was investigated, considering the effects of varying vehicle height and of closely following vehicles (tailgating), such as might be expected in heavy traffic. Measurement errors due to tailgating were attributable to recovery-time limitations inherent in the loop-detector circuit. The techniques described can be used, employing commercial loop-detectors, for traffic applications in which it is desired to determine vehicle velocity and/or size directly in addition to vehicle counting. (Author)

AD-622 095 Div. 33/2 ,14/7 ,13/11
CFSTI Prices: HC $1.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C
DEVELOPMENT, TESTING AND APPLICATION OF ROADWAY-MARKING PAINT,
by S. Kirchner. Oct 65, 18p. Contract DA44 009AMC930T Proj. 1C024401A329 AERDL ,TT T-1805-65; ,65-64094
Unclassified report

Trans. of Plaste und Kautschuk (East Germany) v10 n8 p508-12 1965. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Paints, Navigational aids), (*Roads, Navigational aids), (*Navigational aids, Paints), Civil engineering, Pavements, Traffic, Labels, Wear resistance, Visibility, Feasibility studies, East Germany

The increasing density of traffic makes it necessary to complement customary traffic signs effectively in order to satisfy the requirements for safety and economy of street traffic. This is possible by marking of the roadway. For this purpose, there is available roadway-marking paint whose successful use depends on the quality of the products. Oriented research and development in East Germany has produced paint compositions which permit optimum utilization regardless of base surface. To increase visibility of such markings in the absence of daylight, reflecting substances were added to the paint which simultaneously increased their resistance to abrasion. The newly developed paint corresponds to international standards and satisfies the intended purpose if properly applied as indicated in this article. (Author)

AD-621 826 See Fld. 8/7

13/3. CONSTRUCTION EQUIPMENT, MATERIALS AND SUPPLIES

AD-621 817 See Fld. 16 .

13/4. CONTAINERS AND PACKAGING

AD-621 642 Div. 26/7 ,18/3
CFSTI Prices: HC $10.00 MF $2.25
DEPARTMENT OF THE NAVY WASHINGTON D C
JOINT MILITARY-INDUSTRY PACKAGING AND MATERIALS HANDLING SYMPOSIUM (1ST), WASHINGTON, D. C., OCTOBER 10, 11, AND 12, 1955.
Proceedings.
1956, 696p.
Unclassified report

Prepared in cooperation with the Dept. of the Army, the Dept. of the Air Force, and the Dept. of Commerce. Previously announced 10 Aug 56 as PB-121 350.

Descriptors: (*Packaging, Symposia), (*Handling, Armed forces supplies), (*Logistics, Symposia), Reports, Military requirements, Logistics, Armed forces supplies, Protective treatments, Films, Halocarbon plastics, Transportation, Corrosion inhibition, Temperature control, Storage, Packing materials, Costs, Automation

Contents: Planning military transportation today, Underway replenishment at sea, An essential element of air power, Research and development, Recent industry packaging developments, Teflon films as operating lubricants and preservative coatings, Air drop techniques, A gaseous system for corrosion control, Temperature controlled packages, Materials handling, transportation and warehousing operationg, Materials handling in production, Industrial counterparts of military packaging, A dynamic cushion tester - its application to cushion design, New developments in materials handling, Automatic packaging of military supplies, Joint military packaging course, An approach to the selection of packaging methods, Reducing transportation and handling costs, How can industry control packaging costs.

13/6. GROUND TRANSPORTATION EQUIPMENT

AD-621 955 Div. 11/2 ,2/8
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
A DIMENSIONAL ANALYSIS OF THE PERFORMANCE OF PNEUMATIC TIRES ON SOFT SOILS.
Final technical rept.,
by Dean R. Freitag. Aug 65, 164p. Rept. no. TR-3-688
Proj. 1V021701A046 Task 1V021701A04603
Unclassified report

Available from U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., $3.00. Available from CFSTI MF$1.00.

Descriptors: (*Soils, Trafficability), (*Tires, Performance (Engineering)), (*Trafficability, Tires), Vehicle wheels, Soils mechanics, Clay, Sand, Loading (Mechanics), Mathematical analysis, Model theory, Dynamometers, Performance (Engineering), Experimental data

Treadless pneumatic tires were tested in specially prepared soft soils with a single-wheel dynamometer that was instrumented to measure horizontal and vertical forces, torque, slip, and sinkage. The test tires were of different sizes so that the effects on performance of tire width and diameter could be determined, and the tires were tested at three different degrees of tire deflection. The load on the tire was varied, but the speed of the test wheels was held constant. Two different soils were studied--a wet, frictionless clay and a dry, cohesionless sand. The soil strength was varied over the full practicable range, but with a minimum of variation within a test section. The cone penetrometer was used to measure the resistance of the soil in each case. The experimental results showed, both for the clay and the sand, that the cone penetrometer measurement was a satisfactory means of describing the consistency of the soil, and that true scaled systems could be achieved. The data also showed the influence of each of the independent parameters. A single term was developed for each of the soils that combined all of the independent parameters and this term was shown to be related to the dependent parameters.

AD-621 817 See Fld. 16

AD-621 779 Div. 26/1 ,14/7 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF BONDING RUBBER TO METAL,
by A. D. Poyarkova, and V. L. Rozen. 20 Sep 65, 5p. Rept. no. FTD-TT-65-514
TT , 65-64043
Unclassified report

Unedited rough draft trans. of Russian Patent 166821, pub. 24 Aug 63, appl. no. 854293/23-5.

Descriptors: (*Bonding, Rubber), (*Rubber, Bonding), (*Metals, Bonding), Patents, USSR, Metals, Cobalt compounds, Salts, Alkaline earth compounds, Vulcanization, Seals (Stoppers), Composite materials

The object of the invention is a method of bonding rubber to metal which consists in introducing into a rubber mixture a cobalt salt and placing it on the clean metal or metal previously covered by a solution of the same mixture containing a cobalt salt and then vulcanizing by the ordinary methods. Salts of alkaline metals are added to the rubber mixture to increase the strength of the bond with the metal.

AD-621 784 Div. 26/4 ,17/2 ,24/2 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVELOPMENT OF METHODS OF DEFECTOSCOPY OF METALS WITH APPLICATION OF GAMMA RADIATION,
by G. M. Luppov. 30 Aug 65, 14p. Rept. no. FTD-MT-65-33
TT , 65-64047
Unclassified report

Edited machine trans. of Institut Inzhenerov ZheleznoDorozhnogo Transporta, Moscow. Trudy (USSR) n165 p8291 1963.

Descriptors: (*Metals, Radiography), (*Radiography, Quality control), (*Gamma rays, Radiography), Grain structures (Metallurgy), USSR, Railroad tracks, Ionization, Television equipment, Electrophotography

The following methods of gamma-defectoscopy are discussed: photographic, ionization, xerographic, and television.

AD-621 911 Div. 26/1
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
REPAIRING THICK-WALLED HIGH-PRESSURE VESSELS BY ELECTRIC ARC WELDING,
by G. Kh. Farber, and D. G. Nikitin. Dec 64, 7p. Rept. no. T-418-R
TT , 65-40732
Unclassified report

Trans. of Khimicheskoe Mashinostroenie (USSR) v5 n4 p29-32 1963. Also available from NRC as C-5161.

Descriptors: (*Arc welding, Pressure vessels), (*Pressure vessels, Arc welding), (*Steel, Arc welding), USSR, Maintenance, Thickness, Chromium alloys, Nickel alloys, Molybdenum alloys, Heat exchangers, Welding rods

A welding technique is described for weld buildup of damaged areas in thick-walled vessels and to restore reaction columns and heat exchangers. Three columns and a heat-exchanger were kept under observation during one operating year. The equipment worked at a pressure of 280-300 atmospheres and a temperature of 350-390C inside the reaction columns and 200-350C in the heatexchangers. According to the readings of surface thermocouples the temperature of the outer walls of the apparatus fluctuated within the limits 160-220C. Only in some units was there observed a local overheating to temperatures 250-300C. Visual examinations showed that no visible defects whatever had developed in the repaired areas on the vessel walls.

AD-621 688 See Fld. 5/9

AD-621 748 See Fld. 9/1

AD-621 749 See Fld. 11/6

AD-621 841 See Fld. 20/1

AD-621 844 See Fld. 14/2

AD-621 856 See Fld. 9/1

AD-621 871 See Fld. 15/2

AD-621 873 See Fld. 9/1

AD-621 891 See Fld. 9/1

AD-621 896 See Fld. 9/1

AD-622 094 See Fld. 9/1

AD-622 206 See Fld. 9/1

AD-622 234 See Fld. 11/6

AD-622 256 See Fld. 9/1

13/9. MACHINERY AND TOOLS

AD-621 781 Div. 26/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
CENTRIFUGAL TURBINE ROTOR BLADE,
by Yu. B. Kozlov. 20 Sep 65, 5p. Rept. no. FTD-TT-65-503
TT, 65-64044
Unclassified report

Unedited rough draft trans. of Russian patent 165 038, pub. 29 Jul 63, appl. 849916/24-6, 1p.

Descriptors: (*Turbine blades, Design), Patents, USSR, Thickness, Configuration

The object of the invention is a centrifugal turbine rotor blade which has a thickness that becomes less in the axial direction. For the purpose of increasing the vibration strength of the rotor, the thickness of the blade in any cylindrical section is made to decrease in accordance with a parabolic dependence with the decreasing of the degree of the parabola with a decreasing radius of the cylindrical cross section. (Author)

AD-621 682 See Fld. 21/5

AD-621 995 See Fld. 17/9

AD-622 005 See Fld. 12/1

13/10. MARINE ENGINEERING

AD-621 706 Div. 31/9, 19/5, 31/7
CFSTI Prices: HC $3.00 MF $0.75
HONEYWELL INC ST PAUL MINN SYSTEMS AND RESEARCH DIV
EXPERIMENTAL EVALUATION OF SYMBOLIC AND PICTORIAL DISPLAYS FOR SUBMARINE CONTROL.
Final rept. for 31 Aug 63-30 Sep 65,
by Robert C. McLane, and James D. Wolf. 30 Sep 65, 69p. Rept. no. 1550-FR-1
Contract Nonr367500 Proj. NR196 025
Unclassified report

Descriptors: (*Submarines, Display systems), (*Underwater tracking, Display systems), (*Display systems, Submarines), Nuclear powered vessels, Control systems, Underwater navigation, Evasion, Azimuth, Analog systems, Monitors, Television display systems, Human engineering

The Navy has given extensive support to the development of several different integrated display concepts for nuclear submarines. The report describes a research program through which comparative, empirical analyses of these concepts was accomplished and aid was provided in selection of the most promising approach from a systems effectiveness viewpoint. The experiments established guidelines for use of these integrated displays in vehicle control including monitoring and mission plan revision as a function of external constraints such as attacking weapons systems. The experimental approach employed tests designed to reveal differences which have practical significance to the Navy: by measuring tracking performance with and without forced sampling or blanking; recording reaction, judgment, and decision times; and determinating correctness of decisions on problems requiring interpretive judgment, evasive maneuvers, and return to the preproblem tracking task. (Author)

AD-622 101 Div. 31/9, 30/3
CFSTI Prices: HC $2.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
THE DTMB MARK 2 KNOTMETER,
by George B. Springston, Jr.. Sep 65, 36p. Rept. no. DTMB-2042
Proj. S F011 02 12
Unclassified report

Descriptors: (*Ships, Velocity), (*Velocity, Measurement), Instrumentation, Portable, Meters, Towed bodies, Towing cables, Calibration, Theory

The DTMB Mark 2 Knotmeter is a portable system which measures the speed of a ship through the water at speeds from 3 to 15 knots. The system consists of a towed body, towcable, and associated electronic instrumentation. A transducer in the towed body senses the rotation of an impeller on the body and sends a signal up the towcable for display on an electronic counter, thus providing a measure of the ship speed. In contrast to many speed measuring systems, the Mark 2 Knotmeter is not influenced by the pressure field of the ship since the transducer can be located at a considerable distance from the ship. During steady towing conditions, the speed can be determined to an accuracy of about one percent. Unsteady towing conditions caused by ship motions in a seaway reduce the accuracy to between one and five percent depending on the severity of the ship motions. (Author)

AD-621 627 See Fld. 5/9

AD-621 682 See Fld. 21/5

AD-621 743 See Fld. 11/6

AD-621 870 See Fld. 17/7

13/10.1 SUBMARINE ENGINEERING

AD-621 627 See Fld. 5/9

AD-621 870 See Fld. 17/7

AD-622 071 See Fld. 11/7

AD-622 074 See Fld. 15/5

AD-622 084 See Fld. 11/7

AD-622 116 See Fld. 11/3

AD-622 118 See Fld. 11/7

13/12. SAFETY ENGINEERING

AD-621 853 Div. 13/11
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
NOISE ATTENUATION CHARACTERISTICS OF AN OVERTHE-EAR TYPE PERSONNEL NOISE PROTECTIVEDEVICE.
Special rept.,
by Gilbert C. Tolhurst. 1 May 57, 12p. Rept. no. SR-57-14
Contract N6onr22525 Proj. NR145 993
Unclassified report

Descriptors: (*Ear, Safety devices), (*Safety devices, Ear), Noise, Attenuation, Tests, Test method, Experimental data, Aircraft noise

The attenuation values obtained from the artificial earmanikin head indicate generally, although not consistently, greater attenuation for the RCA-X1 over previously obtained values on the V-51R up to 2000 cps. Above this frequency more attenuation was found for the V-51R. However, for the continuous aircraft type noises the V-51R yielded increased attenuation values. (1) The relative attenuation values for pulsed pure tone threshold shifts were greater for the V-51R at 125 and 250 cps than for the RCA-X1 but were not as great for the frequencies above 250 cps, with the exeption of 8000 cps. (2) For wide-band and octave-bands of noise the relative attenuation values for the V-51R were greater than for the RCA-X1 at two octave bands, 75-150 and 150-300. However, the results were reversed for the other seven noise bands. (3) The Spondee word threshold shift data show increased attenuation for the RCA-X1 over the V-51R by some nine db. (Author)

AD-621 919 Div. 13/11
CFSTI Prices: HC $2.00 MF $0.50
FEDERAL FIRE COUNCIL WASHINGTON D C

FEDERAL FIRE EXPERIENCE FOR FISCAL YEAR 1964.
Sep 65, 40p.

Unclassified report

Descriptors: (*Fire safety, United States Government), Fires, Aerospace craft, Buildings, Forest fires, Ship fires, Federal budgets, Costs, Graphics, Tables

AD-621 676 See Fld. 1/2

AD-622 095 See Fld. 13/2

13/13. STRUCTURAL ENGINEERING

AD-621 643 Div. 13/4
CFSTI Prices: HC $2.00 MF $0.50
ARMY LIBRARY WASHINGTON D C
SOIL COMPACTION AND STABILIZATION: A SELECTED LIST OF TITLES.
Special Bibliography.
28 May 56, 44p. Rept. no. SB-6

Unclassified report

Descriptors: (*Soil mechanics, Bibliographies), Soils, Stabilization, Earth-handling equipment, Civil engineering

The bibliography of selected titles on soil compaction is limited to theory, engineering methods, tests, specifications and control, as well as several case studies. The compilation represents only a small portion of literature available on the subject.

AD-621 707 Div. 13/4 ,25/6
CFSTI Prices: HC $3.00 MF $0.50
BROWN UNIV PROVIDENCE R I DIV OF ENGINEERING
ON THE BEHAVIOR OF ELASTIC PLASTIC TRUSSES CONTAINING UNSTABLE ELEMENTS.
Technical rept.,
by G. Maier. Apr 65, 51p. Rept. no. TR-43
Contract Nonr56220 Proj. NR064 424

Unclassified report

Descriptors: (*Beams (Structural), Structural properties), Elasticity, Plasticity, Stability, Loading (Mechanics), Deformation, Rods, Stresses, Mathematical analysis, Matrix algebra, Structures

Sufficient conditions for uniqueness of incremental response and overall stability are established and discussed for elastic plastic trusses containing unstable members. These criteria consist in the positive definiteness of matrices built up with the elastic influence coefficients of axial forces for dislocations and with the plastic compliances of the members at the yield point. All conditions are proved to be weaker than the usual demand of local stability, for all redundant structures. Normality of the incremental plastic displacement vector in load-space is shown to hold, irrespective of instability, non-linearity in the elastic range and changes of the elastic behavior due to plastic strains. Convexity of the loading surfaces is also briefly discussed, with special reference to the case of non-linear elastic response of some members. (Author)

AD-621 729 Div. 13/4 ,20/2
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
FEASIBILITY OF CONSTRUCTING LARGE UNDERGROUND CAVITIES, BACKGROUND, SITE SELECTION, AND SUMMARY.
Technical rept.,
Jul 64, 88p. Rept. no. TR-3-648 vol. 1
Proj. arpa order 260 62

Unclassified report

Available from Army Engineers Waterways Experiment Station, Vicksburg, Miss. Available from CFSTI MF$0.75.

Descriptors: (*Underground structures, Feasibility studies), (*Nuclear explosions, Test facilities), Costs, Mining engineering, Tests, Underground explosions

The purpose of this investigation was to determine whether construction of large underground cavities for large-yield decoupling is feasible from an engineering and construction standpoint.

AD-621 742 Div. 13/4
JACOBS ASSOCIATES SAN FRANCISCO CALIF
FEASIBILITY OF CONSTRUCTING LARGE UNDERGROUND CAVITIES. REPORT ON COST AND CONSTRUCTABILITY.
Technical rept.
Jun 64, 135p. Rept. no. TR-3-648 vol. 3
Proj. arpa order 260 62

Unclassified report

Hardcopy available from Army Engineers Waterways Experiment Station, Vicksburgh, Miss. as TR-3-648, Vol. III. Available from CFSTI MF$1.00.

Descriptors: (*Underground structures, Feasibility studies), Construction, Costs, Tables, Operations research, Site selection, Earth handling equipment

AD-621 747 Div. 13/4 ,30/4 ,20/2 MF $1.00
COLORADO SCHOOL OF MINES RESEARCH FOUNDATION INC GOLDEN
FEASIBILITY OF CONSTRUCTING LARGE UNDERGROUND CAVITIES. THE STABILITY OF DEEP LARGESPAN UNDERGROUND OPENINGS.
Technical rept.
Jun 64, 157p. Contract DA22 079eng334 Proj. 320327 ,ARPA Order260 62
AEWES , TR-3-648 V2

Unclassified report

Hard copy available from U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss. See also AD 621 729.

Descriptors: (*Underground structures, Feasibility studies), (*Nuclear explosions, Test facilities), Mining engineering, Well logging, Costs, Geological survey, Geography, Lithography, Seismology, Structural properties, Mechanical properties, Stresses, Geometric forms, Mathematical analysis, Elasticity, Plasticity

The report is concerned with theoretical stress distributions on spherical cavities in homogeneous, isotropic, elastic media. The medium in this solution is considered to be infinite but the results are applicable to a semiinfinite body, i.e., one having a free surface, provided the cavity is sufficiently far below the free surface. In the discussion of the results it will be shown that the depth to the top of the sphere may be as small as a diameter of the sphere. The basic solutions developed are for cavities in uniform stress fields in the coordinate axial directions. The stress fields being the stresses existing in the medium in the absence of the cavity.

AD-622 266 Div. 13/4
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF AEROSPACE ENGINEERING AND APPLIED MECHANICS
A THEOREM ON BUCKLING AND STRUCTURAL STIFFNESS,
by William P. Vafakos. 16 Jul 64, 5p. Rept. no. PIBAL-903
Contract Nonr83914 Proj. NR064 167

Unclassified report

Pub. in Journal of Ship Research v9 n1 p9-10 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Buckling (Mechanics), Stiffened cylinders), (*Stiffened cylinders, Buckling (Mechanics)), Structural shells, Loading (Mechanics), Theory, Mathematical analysis, Matrix algebra

Sufficient conditions are presented under which an increase (decrease) of the flexural, torsional, or extensional stiffness in any part of a structure cannot result in a decrease (increase) of the classical buckling load. A problem of axisymmetric buckling of a ring-stiffened circular cylindrical shell under axial compression is considered for illustration. (Author)

AD-621 714 See Fld. 11/3

AD-622 082 See Fld. 15/4

AD-622 233 See Fld. 4/2

AD-622 236 See Fld. 4/2

AD-622 289 See Fld. 20/12

14/2. LABORATORIES, TEST FACILITIES, AND TEST EQUIPMENT

AD-621 674 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
DAVID TAYLOR MODEL BASIN PORTSMOUTH VA UNDERWATER EXPLOSIONS RESEARCH DIV
A PROCEDURE FOR THE CORRECTION OF VELOCITY METER RECORDS,
by Ramon R. Walker. Jun 65, 18p. Rept. no. DTMB-1980

Unclassified report

Descriptors: (*Velocity, Measurement), (*Shock waves, Velocity), Corrections, Analog computers, Integral equations, Transducers, Vibration, Damping, Acceleration, Seismic waves

Correction methods devised to compensate for certain mechanical characteristics of commonly used velocity meters are considered. The application of two corrections for such characteristics, usually referred to as seismic corrections and correction for bottoming, is illustrated and discussed for the measurement of absolute structural velocities. The correction procedures are shown to be theoretically justified. These procedures for correcting the velocity meter output in the measurement of absolute velocities are based on two major premises: One is that the suspension system is linear, and the other is that the entire system is at rest prior to the arrival of the shock motion. Although the procedures thus derived will be applicable in most practical situations, no fundamental limitation dictates either requirement. The procedure can be readily extended to cover the situations where only one or neither of these requirements is met, provided of course, that those situations can be adequately described. (Author)

AD-621 704 Div. 30/3 ,1/7 ,19/5
CFSTI Prices: HC $4.00 MF $1.00
BALL BROTHERS RESEARCH CORP BOULDER COLO
DESIGN AND DEVELOPMENT OF THE BALLOONBORNE SOLAR POINTER BBSP-200.
Final scientific rept. for 15 Jul 64-3 May 65,
by Marvin E. Greeb. 20 Apr 65, 138p. Rept. no. F65-7

Contract AF19 628 4314 Proj. 7621 Task 762102
AFCRL , 65-604

Unclassified report

Descriptors: (*Balloons, Test equipment), (*Attitude control systems, Balloon equipment), (*Tracking, Sun), Solar cells, Solar radiation, Photosensitivity, Stabilization, Monitors, Temperature control, Seromotors, Drives, Instrumentation, Electronic equipment, Airborne, Gondolas

The report summarizes the results of the design, development, and test program of the balloon-borne biaxial solar pointing control, Series BBSP-200. The objective of this program was to develop a system capable of orienting a research instrumentation package toward the center of the solar disc while it is suspended from a high-altitude balloon for an unattended flight period of not less than 10 hours with an accuracy of better than =5 minutes of angular arc in both axes. (Author)

AD-621 788 Div. 30/5 ,17/2
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
NEUTRON ACTIVATION ANALYSIS AS A TOOL FOR THE STUDY OF EXOGENOUS INCLUSIONS IN FERROUS MATERIALS: A PROGRESS REPORT,
by R. Malvano, and F. Rossi. 1964, 23p. Rept. no. SORIN-49

Unclassified report

Paper presented at the Journee EURISOTOP, Torino 25 Sep 1964 (Copies available only to DDC users).

Descriptors: (*Neutron activation, Radioactivation analysis), (*Iron, Radioactivation analysis), (*Stainless steel, Radioactivation analysis), Labeled substances, Refractory materials, Analysis, Lanthanum, Sumarium, Impurities, Non-destructive testings

La and Sm are useful in the 'cool' labelling of refractory materials. The feasibility of direct analysis of La and Sm traces strongly depends on the composition of ferrous materials to be tested: the sensitivity was found to range between 0.015 and 5 micro for the adopted experimental conditions. In any case extremely low sensitivities (better than 0.001 micro g) are reached by employing a destructive technique, which, on the other hand, is always required when the exogenous/total inclusion ratio has to be evaluated (preliminary extraction of the inclusions from the sample). A destructive activation analysis makes possible the study an doublelabelled ferrous materials by means of single determinations: La and Sm traces can be simultaneously determined with good precision even when their concentrations are quite different from each other. Both destructive and direct determinations may be performed in a relatively short time (v.z. a ten samples can be analyzed without difficulty in a 2-day delay, including irradiation, cooling, chemical separation and counting); the accuracy of the method may be kept within = 15%. (Author)

AD-621 790 Div. 30/5 ,4/3
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
TRACE METAL ANALYSIS OF OILS AND ASPHALTS BY NEUTRON ACTIVATION TECHNIQUES,
by L. Ciuffolotti, U. Colombo, R. Malvano, and G. Sinori. 1963, 15p. Rept. no. SORIN-51

Unclassified report

Paper presented at the International Meeting on Organic Processes in Geochemistry, Milano 10-12 Sep 1962. Pub. in Advances in Organic Chemistry Proceedings of the International Meeting in Milan p1-14 1962 (Copies available only to DDC users).

Descriptors: (*Oils, Radioactivation analysis), (*Asphalt, Radioactivation analysis), (*Radioactivation analysis, Neutron activation), Metals, Impurities, Vanadium, Nickel, Italy

The neutron activation method of analysis, and in particular the system tic procedure proposed by the authors, offers the possibility of trace-metal determinations on crude oils and related substances, even when only very small samples are available for the analysis. The excellent accuracy and sensitivity of the method alloy the determination of smaller amounts of metals in petroleum than can be measured by ordinary spectrographic techniques. It may thus be possible to investigate the geochemical significance of trace metals other than vanadium and nickel, and which ordinarily are present in petroleum only in very minute concentrations. Vanadium and nickel can be conveniently determined by a very precise simplified neutron activation technique, without the need for ashing the sample. This procedure, therefore, eliminates potential losses and the consequent low values. (Author)

AD-621 844 Div. 30/3 ,26/4
CFSTI Prices: HC $2.00 MF $0.50
FRANKFORD ARSENAL PHILADELPHIA PA FIRE CONTROL ENGINEERING DIRECTORATE
PHASE SENSITIVE EDDY CURRENT TEST EQUIPMENT.
Memorandum rept.,
by Theodore A. Cox. Aug 65, 27p. Rept. no. M66-2-1

Unclassified report

Descriptors: (*Test equipment, Phase detectors), (*Non-destructive testing, Metals), Hardness, Electromagnetic properties

Nondestructive test equipment was developed to detect an eddy current signal voltage and to automatically resolve it into in-phase and quadrature components. The equipment was then used to perform various tests for the determination of its applicability to hardness measurements of ferrous materials and case depth measurements of ferrous parts. Test results using the automatic phase detection technique were promising, and it is believed that practical systems can be developed for the automatic hardness testing of ferrous materials. Deficiencies in the uniformity of metallurgical characteristics of the reference materials prevented linear correlations from being achieved. Special emphasis will be placed on the procurement of specimens with the desired metallurgical characteristics during the next phase of the program. (Author)

AD-621 909 Div. 30/5 ,30/3
CFSTI Prices: HC $3.00 MF $0.75
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
SYSTEMS FOR THE COLLECTION AND ANALYSIS OF DYNAMIC DATA.
Final technical rept. for Feb 64-Apr 65,
by Ronald D. Kelly. Aug 65, 98p. Rept. no. MAC-402-05A
Contract AF33 615 1314 Proj. 4437 Task 443706
FDL , TR-65-94

Unclassified report

See also AD-613 946.

Descriptors: (*Automatic gain control, Errors), (*Recording systems, Errors), (*Voltmeters, Errors), (*Frequency analyzers, Errors), Data, Dynamics, Statistical functions, Transmission lines

The machine errors are discussed of equipment used for the conditioning, collection, recording, editing, and analysis of data from dynamic processes such as acoustics, strain, or vibration. The specific equipment items studied include special features of signal conditioners (e.g., automatic gain control), signal conditioner to tape recorder transmission line, magnetic tape recorders, gross analyzers (e.g., voltmeters), frequency analyzers, amplitude analyzers, and time domain analyzers. (The machine errors associated with transducers and basic signal conditioners are presented in 'Transducers for Sonic Fatigue Measurements.') Where these errors are controllable, such as the smoothing error associated with the rate of scanning an amplitude window for probability density measurements, pertinent equations are presented for determining the magnitude of these errors as a function of the controllable parameter (s). In addition, the report describes practical usage of the analysis equipment for the detection of non-normality, nonstationarity, and periodicity. (Author)

AD-621 968 Div. 30/3
DEFENCE RESEARCH TELECOMMUNICATIONS ESTABLISHMENT OTTAWA (ONTARIO)
RESISTIVITY MEASURING CIRCUIT USING CHOPPED DIRECT CURRENT.
Revised ed.,
by W. D. Edwards. 29 Mar 65, 3p.

Unclassified report

Pub. in Journal of Scientific Instruments v42 p432-4 Jun 1965 (Copies available only to DDC users). Revision of manuscript received 29 Dec 1964.

Descriptors: (*Measuring devices (Electrical; electronic), Circuits), (*Circuits, Potentiometers), Canada, Semiconductors, Resistance (Electrical), Measurement, Voltage, Direct current

The voltage comparator circuit described by Dauphinee and Mooser has been changed so that the forward and reverse resistances of a non-uniform sample can be measured in addition to the average value normally measured. Modifications also allow sample resistances up to 100 megohms to be measured with an error not exceeding 1%, whilst retaining the low resistance sensitivity of better than 0.0001 ohm. (Author)

AD-622 006 Div. 30/5
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
PRECISION: A SCIENTIFIC VICE.
Professional paper,
by G. H. Perry. 17 Aug 65, 17p. Rept. no. SP-2181

Unclassified report

Descriptors: (*Scientific research, Language), (*Errors, Scientific research), Theory

A widely-held semantic misconception of precision is described. The semantic error that results is sometimes deliberate, sometimes less conscious. In either case, it leads to an over-emphasis on precision when the real quality of interest is accuracy. The implications of this over-emphasis for scientific endeavor are explored, and a recommendation is made. (Author)

AD-622 058 Div. 30/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
NOISE ATTENUATION EVALUATION OF TWO AUDIOMETRIC TESTING BOOTHS.
Special rept.,
by Gilbert C. Tolhurst, and Scott N. Morrill. 15 Jan 59, 8p. Rept. no. SR-59-1

Unclassified report

Descriptors: (*Acoustic equipment, Acoustic properties), Test equipment, Performance (Engineering), Acoustic insulation, Tests, Noise, Attenuation, Audiometry

Two audiometric testing booths, Koppers Co. Model 50 and Industrial Acoustics Co. Model 400

were measured to determine their noise floors and attenuation characteristics in 110 db of ASA white noise. The IAC booth meets the BUMED attenuation requirements and is relatively easy to fabricate. The Koppers booth does not meet the attenuation requirements (especially in the 300600 cps band) and is more difficult to fabricate. There is a 21 db higher ambient noise level in this booth than in the IAC booth. (Author)

AD-622 165 Div. 30/3 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
PHYSIOLOGICAL CHANGES IN ACCLIMATIZATION TO HIGH ALTITUDE. THE USE OF THE A-103 PAULING OXYGEN ANALYZER TO DETERMINE OXYGEN PARTIAL PRESSURE.
Research rept.,
by Burton E. Vaughan, and C. S. Houston. 5 Sep 46, 14p. Rept. no. RR-3
Proj. X720 (Av-376-s)

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Aviation medicine, High altitude), (*High altitude, Acclimatization), (*Pressure vessels, Gas analysis), Pressure breathing, Oxygen, Chemical analysis, Performance (Engineering)

A Model A-103 Pauling Oxygen Analyzer was used to determine oxygen partial pressure in a low pressure chamber during a one month study of acclimatization to high altitude. The instrument and the experimental procedure are described. The oxygen analyzer was checked at least once daily by chemical analysis of the same atmosphere, and the results are shown graphically. Many technical considerations arose in the use of the instrument; these topics were carefully studied, and they are related. As a consequence of this investigation several definite conclusions developed: The oxygen analyzer should be checked occasionally by chemical analysis in order to ascertain if there is a deviation. It may require recalibration by taking readings at two points. Unless the water vapor pressure is known the partial pressure of oxygen cannot be accurately measured on this instrument; however the magnitude of this error is less than 3 mm. at room temperature for air at sea level, but the error increases with altitude. The instrument possesses an inherently high degree of precision. It may be reliably read to within 2 mm. of oxygen partial pressure when corrected for known water vapor pressure and when corrected for its calibration factor, which must be determined. A low range instrument, it is felt, would yield exceedingly accurate results for air analysis at high altitudes. (Author)

AD-622 290 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
THE DEVELOPMENT OF A MULTIFREQUENCY VIBRATOR,
by J. S. King,Jr.. 8 Aug 55, 23p. Rept. no. APL/JHU-CF-2413
Contract NOrd7386

Unclassified report

Descriptors: (*Vibrators (Mechanical), Design), (*Test equipment, Guided missile components), Power amplifiers, Wiring diagrams, Calibration

The vibration caused by missile flight is a noise type signal consisting of many different frequency components. Ground vibration tests of missile components, however, are simple sine wave signals produced by rotating motor generator sets. To bridge this gap, the engineering group at APL undertook the development of a system to vibrate components with a multifrequency signal. The approach to the problem was to replace the motor generator sets with an electronic amplifier as a power source. An actual flight vibration tape could then be used to energize the shaker.

AD-621 632 **See Fld. 6/12**

AD-621 647 **See Fld. 5/10**

AD-621 673 **See Fld. 17/7**

AD-621 686 **See Fld. 1/4**

AD-621 689 **See Fld. 20/3**

AD-621 728 **See Fld. 4/2**

AD-621 730 **See Fld. 17/7**

AD-621 740 **See Fld. 20/4**

AD-621 747 **See Fld. 13/13**

AD-621 753 **See Fld. 4/2**

AD-621 784 **See Fld. 13/8**

AD-621 857 **See Fld. 20/4**

AD-621 880 **See Fld. 8/14**

AD-621 993 **See Fld. 8/10**

AD-622 000 **See Fld. 13/2**

AD-622 088 **See Fld. 20/3**

AD-622 101 **See Fld. 13/10**

AD-622 102 **See Fld. 20/6**

AD-622 196 **See Fld. 20/12**

AD-622 203 **See Fld. 9/1**

AD-622 204 **See Fld. 9/1**

AD-622 207 **See Fld. 9/5**

14/3. RECORDING DEVICES

AD-622 282 Div. 5/3 ,1/1
CFSTI Prices: HC $3.00 MF $0.75
DAYTON UNIV OHIO RESEARCH INST
FLIGHT TEST EVALUATION OF THE A/A24U-6 STRUCTURAL LOADS DATA RECORDING SYSTEM.
Final rept.,
by Robert J. Dominic. Sep 65, 64p. Contract AF33 615 1478 Proj. 1390 Task 139001
FDL , TR-65-178

Unclassified report

Descriptors: (*Digital recording systems, Tests), (*Flight testing, Magnetic recording systems), (*Magnetic recording systems, Flight testing), Aerodynamic loading, Airspeed, Acceleration, Altimeters

A flight test evaluation of the Whittaker A/A24U-6 Structural Loads Data Recording System was conducted to determine the capability of the recorder to acquire flight loads data for use in the Air Fore Structural Integrity Program. The system consists of a small, eight-channel, airborne, digital tape recorder; a magnetic tape magazine; and a ground playback converter. A 24-flight evaluation program was conducted using an F-102 aircraft to acquire a nominal sample of VGH flight loads data. Measurements of identical acceleration peaks were successfully correlated on both systems by signals from a precise, master, timereference source recorded by both systems. The Whittaker system was found to be a reliable means of recording both 6 cps and 12 cps vertical acceleration data. Comparisons of acceleration frequency distributions indicated that those data obtained from the Whittaker recorder had essentially the same distribution function as data obtained simultaneously by the oscillograph recorder. Pressure transducers used to measure airspeed and altitude were judged to be less accurate and less reliable than the rest of the Whittaker system. It is concluded that overall system accuracy can be increased by increasing the digital count of the acceleration, airspeed, and altitude measurements to seven digital bits. (Author)

14/5. REPROGRAPHY

AD-621 736 Div. 24/2 ,2/4 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
APPLICATION OF DIGITAL COMPUTERS FOR AEROTRIANGULATION,
by A. N. Lobanov. 15 Sep 65, 25p. Rept. no. FTD-TT-65-380
TT , 65-64032

Unclassified report

Unedited rough draft trans. of Geodeziya i Kartografiya (USSR) n11 p29-42 1958.

Descriptors: (*Aerial photography, Photointerpretation), (*Digital computers, Photointerpretation), (*Surveying, Aerial photography), Photogrammetry, Stereoscopic photography, Mathematical models, Geodesics, USSR

The aim of aerotriangulation is to find by aerial photographs the geodetic coordinates of points on the ground. This general problem may be separated into three individual ones: (1) determination of elements of reciprocal orientation of aerial photographs, (2) plotting of the ground model, i.e. calculation of photogrammetric coordinates of ground points, and (3) outer orientation of the model by reference marks, i.e. calculation of geodetic coordinates of ground points.

AD-621 784 **See Fld. 13/8**

15/2. CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE

AD-621 865 Div. 3/4
CFSTI Prices: HC $6.00 MF $1.25
GENERAL TIRE AND RUBBER CO WABASH IND INDUSTRIAL PRODUCTS DIV
A PRODUCTION ENGINEERING STUDY OF THE PROTECTIVE CIVILIAN, CD V-805 MASK.
Final rept., phase 2.
24 Jul 63, 227p. Contract DA30 070CML1250

Unclassified report

Descriptors: (*Protective masks, Manufacturing methods), Protective mask filters, Processing, Quality control, Industrial equipment, Industrial production, Machines, Tests, Valves, Welding

The report presents a detailed descriptive analysis of the manufacturing processes, procedures, and equipment required to produce the Protective Civilian CD V-805 Mask at the rate of 100,000 acceptable mask per month based upon a two-shift, five-day week and a twenty-day work month. The descriptive analysis is based upon the experience and knowledge gained by The General Tire and Rubber Company during the production of 25,000 CD V-805 Mask produced in accordance with requirements of the Production Engineering Study, Contract DA 30-070-CML1250 with the U. S. Army Chemical Corps. The assembly line presented in the main body of the report is not an analysis of the assembly line fabricated to produce the 25,000 CD V-805 Mask on the engineering study. The technical data developed on the engineering study is presented in the appendix along with additional data to aid in the analysis of the large volume production line concept. The appendix also presents a complete Quality Control Plan outlining the quality control requirements for the assembly line in the report.

AD-621 871 Div. 3/4 ,26/1
CFSTI Prices: HC $5.00 MF $1.00
DIRECTOR OF ENGINEERING AND INDUSTRIAL SERVICES EDGEWOOD ARSENAL MD
TYPE II GAS AEROSOL FILTER MATERIAL. MANUFACTURING DIRECTIVES: PROCESS AND PRODUCTION STUDIES.
Summary rept.,
by P. R. Proto. Dec 64, 175p. Rept. no. DEIS-2

Unclassified report

Also includes: Riegel Paper Corp., New York, Process and Production Study of E-18 Gas Aerosol Filter Material (Paper-Making Process), by Henry J. Powell, Contract DA18 108CML6524.

Descriptors: (*Protective mask filters, Manufacturing methods), Charcoal, Activated carbon, Chemical warfare agents, Aerosols, Specifications, Gas filters, Paper

This report covers that portion of the engineering effort by DEIS, Edgewood Arsenal related to the establishment of manufacturing directives and specifications for Type II Gas Aerosol Filter Material. It forms a part of the overall effort by DEIS in the preparation of a technical data package required for the manufacture of the M22 Civilian Protective Mask. Section I describes the operations used by the Pittsburgh Activated Carbon Company for impregnating activated charcoal. Directions for manufacturing Type II Gas Aerosol Filter Material and its component materials (core and backing materials) are found in Section III. A comprehensive report by Riegel Paper Corporation covering process and production studies, on gas aerosol filter material is found in Section IV. Section V contains specifications for filter material core material, backing material and charcoal. (Author)

AD-622 286 Div. 3/4
CFSTI Prices: HC $3.00 MF $0.75
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
PERSPETIVES IN DETECTION. VOLUME I.
Technical rept. for Feb 64-Feb 65,
by Edward J. Poziomek. Aug 65, 74p. Rept. no. CRDLR-3295
Proj. 1A014501A91A

Unclassified report

Descriptors: (*Gas detectors, Chemical warfare agents), (*Chemical warfare agents, Gas detectors), Reviews, Bibliographies, Catalysis, Reaction kinetics, Chromatographic analysis, Free radicals, Dosimeters, Photographic film, Fluorescence, Metals, Ions, Kinetics, Photochemistry, Reaction kinetics

This report is intended for research workers in detection and includes a survey of current literature on the following: (1) catalytic and chain reactions, (2) chromatography, (3) class tests, (4) films, (5) fluorescencechemilumines
cence, (6) general considerations, (7) kinetics, (8) metal ions, (9) olfaction, (10) photochemistry, (11) reaction mechanisms, (12) reagents, (13) general reviews, (14) solids-surfaces, and (15) theoretical considerations. A general discussion, an annotated bibliography, and a subject index comprise the report. It is concluded that the use of free radicals as reagents, intermediates, or products in analytical reactions, because of their rapid rates, should be examined for applications to detection. (Author)

AD-622 292 Div. 3/4
CFSTI Prices: HC $2.00 MF $0.50
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
REACTION OF 4-FORMYL-1-METHYL PYRIDINIUM IODIDE OXIME (4-PAM) WITH ISOPROPYL METHYLPHOSPHONOFLUORIDATE, GB.
Technical rept. for Aug 56-Jun 58,
by J. C. Lamb, G. M. Steinberg, S. Solomon, and B. E. Hackley,Jr.. Aug 65, 33p. Rept. no. CRDLR-3296
Proj. 1C622401A097

Unclassified report

Descriptors: (*G agents, Chemical reactions), (*Cholinesterase inhibitors, Chemical reactions), Organic phosphorus compounds, Oximes, Iodides, Therapy, Ions, Hydroxamic acids, Decomposition

The reaction of GB with 4-formyl-1-methylpyridinium iodide oxime (4-PAM), a model treatment compound for anticholinesterase poisoning, in near-neutral aqueous solution yields O- (isopropyl methylphosphono)-4-formyl 1 - methylpyridinium iodide oxime (4-PPAM). Its rate of formation is defined by the relationship dx/dt = k (GB) (4-PAM anion), where k = 885 = 70/M/min, 30 C, pH 7.6, 0.1 M KNO3. 4-PPAM is stable in acidic and neutral aqueous solution. Its decomposition in alkaline solution is defined by the relationship dx/dt = k (OH) (4-PPAM), where k = 8600/M/min, 30 C, 0.1 M KC1. 4-PPAM is a potent anticholinesterase. Its decomposition in nearneutral aqueous solution is speeded by imidazole, 4-PAM, bicarbonate, and two hydroxamic acids. (Author)

15/3. DEFENSE

AD-621 644 Div. 18/1 ,32/8
CFSTI Prices: HC $6.00 MF $1.25
ARMY LIBRARY WASHINGTON D C
UNITED STATES NATIONAL SECURITY.
Special bibliography.
15 Jun 56, 223p. Rept. no. SB-7
TT , 65-64025

Unclassified report

Descriptors: (*National defense, Bibliographies), (*Bibliographies, National defense), Cold war, Military strategy, Government (Foreign), Foreign policy, Political science, USSR, China, Great Britain, United States, Aerial warfare, Nuclear warfare, Unconventional warfare, Psychological warfare, Disarmament

This study is intended as an aid to policy-makers, planners, researchers and students involved in matters pertaining to the national security of the U. S. This publication consists of approximately 1,000 unclassified titles of magazine articles, reports, books, and other materials in the holdings of the Army Library, and covers a period of two years, from early 1954 through May 1956. As a further aid to the user each title is followed by an abstract. This bibliography has been limited to literature describing only some of the countries of the world although national security interests of the U. S. as a world power are involved in all the areas of the globe. Africa, and Latin America, for example, have been omitted because of space and time limitations, and it is anticipated that these and other areas will be treated in subsequent studies. Because the subject of guided missiles, both U. S. and foreign, has been presented in the Army Library's Special Bibliography No. 4, 20 April 56, references to guided missiles have been excluded from this study.

AD-621 998 Div. 18/1 ,13/1 ,9/1
CFSTI Prices: HC $4.00 MF $1.00
MONTANA STATE UNIV BOZEMAN DEPT OF MECHANICAL ENGINEERING
VENTILATION OF FALLOUT SHELTERS BY INDUCED DRAFT.
Rept. for 1 Jul 64-30 Jun 65,
by C. F. Whitehill, H. F. Mullikin, and O. A. Kubal. 30 Jun 65, 148p. Contract OCD PS64 211

Unclassified report

Descriptors: (*Radioactive fallout, Shelters), (*Shelters, Ventilation), (*Ventilation, Shelters), (*Civil defense systems, Shelters), Gas flow, Exhaust gases, Combustion products, Ducts, Health physics, Thermodynamics

Occupants of family-type fallout shelters require fresh ventilation air at the minimum survival rate of 3 cfm per person. Because cost limitations exclude the use of auxiliary power plants (diesel or gasoline engines) to operate ventilating fans or blowers, an inexpensive, simple, and effective method of supplying fresh air to home shelters is needed. It is demonstrated that a minimum air rate can be obtained in home shelters by inducing draft in the exhaust stack by means of a flame from a kerosene burner which can simultaneously provide illumination. The ventilation test procedure included inducing air to flow through the shelter, determining the actual cubic feet per minute of air flowing, measuring air temperatures at inlet, room, and stack, measuring the pressure drop or restriction to air flow at the shelter inlet, and finding the effects of various stack sizes and configurations upon air flow rates. Data were also taken to determine the effect of various stack sizes and configurations on the fuel consumption of the heating devices. Ventilation of family-type shelters by the induced draft method is effective and reliable if the following conditions are observed: (1) Wind velocities around the stack outlet are kept to a minimum or a good ventilator stack cap is used; (2) filters are not used at the shelter inlet (air taken from body of house); and (3) the intake area of shelter is much larger than the cross-sectional area of the stack. (Author)

AD-622 049 Div. 18/1 ,18/7 ,15/2
CFSTI Prices: HC $2.00 MF $0.50
INSTITUTE OF NAVAL STUDIES CAMBRIDGE MASS
A GAME OVER SPACES OF PROBABILITY DISTRIBUTIONS.
by John M. Danskin. 1964, 34p. Proj. 493 2

Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n2 and 3 p157-89 Jun-Sep 1964.

Descriptors: (*Game theory, Statistical distributions), (*Antimissile defense systems, Military strategy), (*Military strategy, Game theory), Antisubmarine defense systems

This paper analyzes a two person zero-sum game in which the strategies on the two sides are probability distributions. The solutions always turn out to contain jumps. In most cases the distributions are combinations of delta functions and density functions. The problem is as follows: a submarine chooses a range r, within a declared war zone, at which to fire his missile. If he is detected at a larger range he attempts to fire at that larger range with the effectiveness at that range decreased by defense measures such as attempts to kill the submarine, shoot down the missle, or protect the target.

If this defense effectiveness is denoted by omega, with omega = 0 referring to perfect defensive reaction measures, and omega = 1 referring to poor defensive reaction measures, the following is true. If omega = 0, the problem is analogous to a problem ('The Two Machine-gun Duel') solved by L. Gillman and the author in 1949 (Ref. 2) and is not difficult. The defenses in this case are in close to the coast. If omega = 1 the problem is different but not difficult and the defenses are well out towards (and in some cases at) maximum missile range. There are for omega = 1 no defenses near the coast; this is referred to as an 'initial gap.'

AD-622 096 Div. 18/1
CFSTI Prices: HC $2.00 MF $0.50
HUDSON INST INC HARMON-ON-HUDSON N Y
A NEW LOOK AT THE DESIGN OF LOW-BUDGET CIVIL DEFENSE SYSTEMS.
Research rept.,
by William M. Brown. 2 Aug 65, 42p. Rept. no. HI-478-RR
Contract OCD PS64 116 Task 4211B
Unclassified report

Descriptors: (*Civil defense systems, Urban areas), Design, Vulnerability, Shelters, Nuclear warfare, Nuclear warfare casualties, Warning systems, Radioactive fallout, Population, Survival, Deterrence, Countermeasures, Budgets, Costs, Effectiveness

The feasibility of designing highly effective low-cost Civil Defense systems is examined in relationship to various war outbreak scenarios and the utility of the associated preattack warning period. It is argued that with moderate confidence such highly effective systems can be designed. They would depend upon a general mobilization of civilian resources during an emergency to greatly expand and improve any existing C. D. capability. Ideally such designs can visualize attaining the goal of zero casualties; however, a dynamic plan would contain several options to handle the many imperfections which would almost certainly appear during implementation. The essential elements of the C. D. designs are examined separately for technical, political, administrative, and strategic feasibility. It is concluded that this approach offers substantial promise for future C. D. developments. (Author)

AD-622 099 Div. 18/1
CFSTI Prices: HC $3.00 MF $0.75
PITTSBURGH UNIV PA DEPT OF SOCIOLOGY
THE 1964 CIVIL DEFENSE POSTURES: PUBLIC RESPONSE.
by Martha Willis Anderson. Aug 65, 97p. Contract OCD OS63 48
Unclassified report

Descriptors: (*Civil defense systems, Public opinion), Cold war, Shelters, Budgets, Federal budgets, Urban areas, Survival, Attitudes, Probability, Correlation techniques, Tables

The paper presents an investigation into perceptions of desirability and probability of certain alternative Civil Defense programs. It is one of a series of papers based on data from a University of Pittsburgh national study entitled Civil Defense and Cold War Attitudes, conducted during mid-1964 with a probability sample of 1464 Americans. The focus of the paper is the list of six possible Civil Defense programs, called Postures, presented in the questionnaire. Desirability and probability evaluations were run against other relevant Civil Defense, Cold War and personal characteristic variables in order to attempt to determine the extent and character of support for these differing types of programs. The vast majority of the respondents found all six Postures to be desirable and probable. Between 64.9% and 74.1% assessed each Posture as highly desirable and 42.3% consistently rated every Posture as highly desirable. Although the Postures differed in the type of program suggested, the evaluations given to them were very much the same. Further, few of the variables against which these evaluations were run yielded any explanation of the causes of support. It was concluded that these consistently high evaluations reflected a faith in the government and in any program that it might endorse. (Author)

AD-622 108 Div. 18/1 ,18/7 ,32/8
CFSTI Prices: HC $3.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
THE ROLE OF MISSILE DEFENSE IN SOVIET STRATEGY AND FOREIGN POLICY,
by John R. Thomas. Mar 65, 51p. Rept. no. RAC-P-1
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Military strategy, USSR), (*Antimissile defense systems, USSR), (*Foreign policy, Defense systems), Strategic weapons, Government (Foreign)

AD-622 111 Div. 18/1 ,18/7
CFSTI Prices: HC $2.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
THE NATO NUCLEAR BILATERAL FORCES,
by Irving Heymont. Jun 65, 37p. Rept. no. RAC-P-4
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*National defense, Nuclear weapons), (*Nuclear weapons, National defense), Political science, Military tactics, Military strategy

The controversy over the proposed NATO Multilateral Force (MLF) has obscured the existence of the NATO bilateral nuclear forces. These forces are composed of separate national and United States contingents and require joint action to be effective. Neither the MLF nor the bilateral forces satisfy the national aspirations of the NATO nations. The problem is political, rather than military, and requires formulation of a nuclear policy that meets the national aspirations of the NATO members and politically unites rather than divides the NATO alliance. Military arrangements such as multilateral or bilateral nuclear forces can be a part of such a political policy but cannot be a substitute. (Author)

AD-622 113 Div. 18/1
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
MILITARY COST ANALYSIS.
Paper,
by Robert N. Grosse, and Arnold Proschan. 15 Jul 65, 12p. Rept. no. RAC-P-6
Unclassified report

Prepared for presentation at the NATO Conference on Applications of Operations Research to Military Resource Allocation and Planning, Sandefjord, Norway, Aug 65.

Descriptors: (*Weapon systems, Costs), (*Defense systems, Costs), Analysis, Operations research, Decision theory, Department of Defense, Economics

Various factors to be considered in making cost analyses of defense and weapons systems are discussed.

AD-621 805 **See Fld. 16**

AD-622 040 **See Fld. 15/7**

15/4. INTELLIGENCE

AD-622 082 Div. 18/2 ,18/3 ,13/4
CFSTI Prices: HC $3.00 MF $0.75
CRAIG SYSTEMS INC LAWRENCE MASS
MOBILITY ASPECTS OF A SYSTEM DESIGN FOR A DEPLOYABLE RECONNAISSANCE EXTRACTION FACILITY,
by Alex J. Reynolds, and Stanford T. Hovey. Jul 65, 64p. Contract AF30 602 3193 Proj. 6506
RADC , TR-65-222
Unclassified report

Descriptors: (*Aerial reconnaissance, Ground support equipment), (*Combat information centers, Mobile), (*Shelters, Mobile), Dollies, Positioning devices (Machinery), Power supplies, Air conditioning equipment, Systems engineering, Military intelligence, Air Force operations

This report contains an analysis of factors to be considered in the selection of shelters, power, air conditioning, and transporters relative to efficiency in the attainment of over-all mobility. The evaluations presented herein involved ensuring the best and most timely use of existing technologies. Selection of what was considered to be optimum choices in unit equipments was then integrated to evolve a standard plan for deployment. (Author)

15/5. LOGISTICS

AD-621 890 Div. 18/3 ,12/3 ,15/1 MF $1.00
OFFICE OF NAVAL RESEARCH WASHINGTON D C
NAVAL RESEARCH LOGISTICS QUARTERLY, VOLUME 11, NO. 4.
Dec 64, 132p.
Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50, as D.210.12:11/4.

Descriptors: (*Logistics, Naval research), Weapon systems, Stock level control, Inventory analysis, Costs, Guided missiles (Underwater-to-surface), Mathematical models, Quadratic programming, Probability, Optimization, Stochastic processes, Game theory, Queueing theory

Contents: Polaris military essentiality system; Polaris logistics model; Simplicial methods for quadratic programming; Distribution of rounds fired in stochastic duels; Delay dependent queue discipline; Stock level distributions for (s, S) inventory problems; Economical reorder quantities and reorder points with uncertain demand (AD-622 045); Model for minimizing cost of aerial tankers support of a practice bomber mission.

AD-622 041 Div. 29/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
COMPARATIVE TESTING OF ELECTRICALLY HEATED FLYING SUITS (TAYLOR SUIT VERSUS U. S. NAVY SUIT).
1943, 16p. Rept. no. NSAM-101
Proj. X128Av C3 1
NAVMED , X-128 (Av-C3-1)
Unclassified report

Descriptors: (*Flight clothing, Environmental tests), Protective clothing, Heating, Flotation, Performance (Engineering)

The Taylor suit is superior to the Navy suit in respect to construction, electrical characteristics, and protection against cold. The Colvinex suit is more comfortable than the Taylor suit. (Author)

AD-622 045 Div. 18/3 ,26/2 MF $0.50
LITTLE (ARTHUR D) INC CAMBRIDGE MASS
ECONOMICAL REORDER QUANTITIES AND REORDER POINTS WITH UNCERTAIN DEMAND,
by Lawrence L. Parker. 1964, 11p. Contract Nonr340600
Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n4 p351-8 Dec 1964. Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50 in D.210. 14:11/4.

Descriptors: (*Logistics, Naval research), (*Inventory control, Economics), Inventory analysis, Probability, Stock level control

The problem of determining reorder quantities and reorder points that minimize the total costs of carrying inventory, placing orders, and penalties for back orders, in the face of uncertain demand, is considered in this paper. By making approximations to the total cost function and the safety factor versus service function relationship, an economic order quantity is derived that depends on the uncertainty in the forecast of demand during the lead time, but is independent of the back order cost. Reorder points are then determined for the case in which the back order cost is explicitly stated, and for the case in which the back order cost is unknown and the desired customer service is used as the controlling parameter. Simulations indicate that, when compared with use of the Wilson economic order quantity, the use of the formulae derived in this paper will lead to approximately a 5-7-percent reduction in the total cost. (Author)

AD-622 051 Div. 29/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A STUDY OF THE MANNER IN WHICH MASK LEAKS CHANGE WITH VARYING NEGATIVE PRESSURES.
Research rept.,
by C. H. Fugitt. 29 Jan 45, 10p. Rept. no. NSAM-130 ,RR-1
Proj. X521Av275f
NAVMED , X-521 (Av-275-f)
Unclassified report

Descriptors: (*Oxygen masks, Pressure), (*Gas leaks, Oxygen masks), Test methods, Low-pressure research, Life support

A study was made of the manner in which oxygen mask leaks change when subjected to varying negative pressures ranging from 1.0 to 7.0 cm. water. The 101 leaks studied may be divided into the following groups: 37 which decreased with added suction; 26 which increased with added suction; 10 in which the tendency of the leak to increase or decrease was reversed as the negative pressure was increased from 1.0 to 7.0 cm. water; 18 which were in excess of 600 cc. in 10 seconds and remained at this high level; 5 which were essentially independent of increased suction; and 5 which were not definite enough in their behavior to permit interpretation. Most mask leaks change with added suction, some improving in fit and other becoming worse. It is believed that 2.0 cm. water should be a satisfactory practical value to use for mechanical leak testers. (Author)

AD-622 053 Div. 18/3
CFSTI Prices: HC $1.00 MF $0.50
DEPUTY CHIEF OF STAFF FOR LOGISTICS (ARMY) WASHINGTON D C DATA PROCESSING CENTER
A METHOD OF RESOURCE ALLOCATION USING DEMAND PREFERENCE,
by John C. Gilbert. 1964, 10p.
Unclassified report

Pub. in Naval Research Logistics Quarterly, v11 n2/3 p217-25 Jun-Sep 1964.

Descriptors: (*Logistics, Management planning), (*Scheduling, Logistics), Iterative methods, Programming (Computers), Transformations (Mathematics), Linear programming, Operations research

In many military problems, it is impossible to establish a function describing the relative military worth of resources. Demand for these resources is usually created from some higher level goal. The algorithm described in this paper provides a procedure for allocating scarce resources among competing demands in such a situation. (Author)

AD-622 074 Div. 18/3 ,15/1 ,26/2 ,31/4 MF $0.50
GEORGE WASHINGTON UNIV WASHINGTON D C LOGISTICS RESEARCH PROJECT
A POLARIS LOGISTICS MODEL,
by M. Denicoff, J. Fennell, S. E. Haber, W. H. Marlow, and Henry Solomon. 1964, 17p.
Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n4 p259-72 Dec 1964. Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50 in D210.14:11/4.

Descriptors: (*Logistics, Mathematical programming), (*Inventory control, Submarines), (*Naval research, Inventory control), (*Submarines, Inventory control), Operations research, Undersea warfare, Naval operations

This paper presents a basic loss minimization model which has been applied in varying contexts for Polaris logistics problems. Definitive results are obtained in a general framework which extends the classic newsboy problem in two principal directions. First, probability distributions for demand are unrestricted. Second, a general framework for 'penalties' or 'premiums' is introduced to permit formulation of possibly non-convex loss functions. The main result is a constructive existence theorem for minimum values of these general expected loss functions. (Author)

AD-622 075 Div. 18/3 ,15/1 ,26/2 MF $0.50
NEW YORK UNIV N Y
STOCK LEVEL DISTRIBUTIONS FOR (S, S) INVENTORY PROBLEMS,
by Harold Greenberg. 1964, 10p.
Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n4 p343-9 Dec 1964. Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50 in D210.14:11/4.

Descriptors: (*Stock level control, Dynamic programming), (*Inventory analysis, Stock level control), Optimization, Operations research, Probability, Statistical distributions, Integral equations, Mathematical analysis

The transient probability distribution for the stock level is found for the (s, S) inventory model. An integral equation is obtained for the stock level distribution from the state equations. The integral equation is solved in terms of a parameter, which is obtained by solving a renewal type equation. The steady-state results are then obtained from the transient solutions. (Author)

AD-622 078 Div. 18/3 ,18/4 ,15/1 ,1/4 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
NOTE ON A MODEL FOR MINIMIZING COST OF AERIAL TANKERS SUPPORT OF A PRACTICE BOMBER MISSION,
by J. Bracken, and J. D. Longhill. 1964, 9p.
Unclassified report

Pub. in Naval Research Logistics Quarterly v11 n4 p359-64 Dec 1964. Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50 in D210.14:11/4.

Descriptors: (*Logistics, Refueling in flight), (*Refueling in flight, Logistics), (*Air Force operations, Refueling in flight), (*Linear programming, Air Force operations), Theory, Bombers, Mission profiles, Tanker planes, Penetration, Aircraft defense systems, Costs, Optimization, Operations research

Using a typical example of a practice bomber penetration of the North American Air Defense Net, a hypothetical linear programming model for minimizing the cost of aerial tanker support is developed. Fuel requirements of the bombers, delivery capabilities of the aerial tankers, and various aspects of costs of refueling are considered. (Author)

AD-622 080 Div. 18/3
CFSTI Prices: HC $2.00 MF $0.50
CORNELL UNIV ITHACA N Y DEPT OF INDUSTRIAL AND ENGINEERING ADMINISTRATION
THE SCHEDULE OF ECONOMIC LOT SIZES,
by William L. Maxwell. 1964, 37p.
Unclassified report

Pub. in Naval Research Logistics Quarterly, v11 n2/3 p89-124 Jun-Sep 1964.

Descriptors: (*Logistics, Management planning), (*Scheduling, Logistics), Economics, Inventory analysis, Operations research, Mathematical programming, Stock level control, Production control

A general model was developed for the sequencing of lot sizes through a single machine for the case of deterministic demand at a constant rate for each of several products and under the situation in which the changeover time on the machine is dependent upon the sequencing of products. The problem was shown to be one of minimizing a quadratic criterion function subject to linear restraints over the possible cycles (sequences) of production. Even extremely simplified versions of the problem reduced to problems whose solutions still defy operational analysts. In an attempt to study the problem experimentally rather than analytically it was proposed that the rather cumbersome parameter, the changeover matrix, be characterized as a linear combination of certain extreme changeover matrices, whose effect on policy might be determined analytically. For the case of a changeover matrix with equal entries (Equal Entry) it was shown that demand variability over products had to be rather high in order to justify other than a strict sequencing of the products through the machine (rotation cycle). Also in the case of the Equal Entry changeover matrix it was established that a cycle whose length is one more than the number of products must be a rotation cycle, but that the result does not hold when the cycle length is two more than the number of products. In the case of the Come-Down changeover matrix and the Proportional Come-Down changeover matrix the nature of the best cycle was established.

AD-622 199 Div. 18/3 ,22/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE LAB WHITE OAK MD EXPLOSION DYNAMICS DIV
MAXIMUM LIKELIHOOD LOGISTIC ANALYSIS OF SCATTERED GO/NO-GO (QUANTAL) DATA,
by Laurence D. Hampton, and Gerald D. Blum.
26 Aug 65, 19p. Rept. no. NOLTR-64-238
Task NOL443 NWL
Unclassified report

Descriptors: (*Logistics, Statistical analysis), (*Statistical analysis, Logistics), Explosive materials, Sensitivity, Shock (Mechanics), Mathematical models

Maximum likelihood theory has been applied to the analysis of scattered sensitivity data. The analysis can be used also for collected data. The logistic distribution is assumed. The calculation of percent points with their confidence limits is illustrated. A program for the IBM 7090 computer is included. (Author)

AD-621 642 See Fld. 13/4

AD-622 023 See Fld. 5/1

AD-622 082 See Fld. 15/4

AD-622 109 See Fld. 5/1

AD-622 112 See Fld. 5/1

AD-622 116 See Fld. 11/3

15/7. OPERATIONS, STRATEGY, AND TACTICS

AD-621 804 Div. 18/7 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
STRATEGIC MISSILES: MILITARY SURVEY.
Special trans.,
by N. Krylov. 27 Nov 63, 7p. Rept. no. AID-T-63-119b
TT , 65-64061

Unclassified report

Trans. from Izvestiya (USSR) 17 Nov p4 1963.

Descriptors: (*Guided missiles (Surface-to-Surface), USSR), Military strategy, Military tactics

AD-622 040 Div. 18/4 ,18/1
CFSTI Prices: HC $3.00 MF $0.75
SYSTEMS ENGINEERING GROUP RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
OPTIMIZATION OF AERIAL DEFENSE PATROLS FOR DETECTION OF AERIAL TARGETS.
Internal rept.,
by Gwon H. Lum, and Mary D. Lum. Jul 65, 62p. Proj. 7071 Task 707101
ARL , 65-142

Unclassified report

Descriptors: (*Aerial warfare, Patrol planes), (*Aerial targets, Detection), Optimization, Defense systems, Probability, Counterinsurgency, Limited war, Radar equipment, Mathematical analysis

A mathematical representation, with detection probability used as a measure of detection capability, is formulated for constant velocity moving-target-by-moving patrol detection where the patrol employs simple pattern movements. The most essential idea pervading the theory is that the space-time target region separates into two nonoverlapping subregions characterized as follows: those target points which can be detected at least once ('detection region') and those target points which can never be detected by the patrol. This formulation leads to a simple mechanism for determining whether the patrol starting at some arbitrary point in the pattern will or will not detect a target starting from an arbitrary point in the plane of the pattern. Also whenever detection is possible, the number of times the target is detected and the corresponding durations are theoretically determinable.

AD-622 115 Div. 18/4
CFSTI Prices: HC $1.00 MF $0.50
RESEARCH ANALYSIS CORP MCLEAN VA
AN APPROACH TO FORCE COMPOSITION ANALYSIS.
Paper,
by Oliver Bryk. 12 Aug 65, 12p. Rept. no. RAC-P-9

Unclassified report

Prepared for presentation at the NATO Conference on Applications of Operations Research to Military Resource Allocation and Planning 23-26 Aug 65, Sandefjord, Norway.

Descriptors: (*Operations research, Armed forces operations), (*Armed forces operations, Operations research), Systems engineering, Costs

AD-622 238 Div. 18/7 ,32/9
CFSTI Prices: HC $4.00 MF $1.00
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
NECESSITY AND CHANCE IN WAR,
by S. A. Tyushkevich. 29 Apr 64, 150p. Rept. no. AID-U-64-30
TT , 65-64126

Unclassified report

Trans. of mono. Neobkhodimost i Sluchainost v Voine, Moscow, 1962, p1-11, 31-65, 74-135.

Descriptors: (*Warfare, Probability), Cold war, Nuclear warfare, Nuclear weapons, History, Decision making, Economics, Political science, Social sciences, Military strategy, Communism, USSR

Contents: Necessity and chance in the process of inception of war; Sources and role of chance in the inception of war; Intensification of the danger of the accidental launching of another world war; Possibility of preventing war and accidents leading to it; Necessity and chance in the course of war; Economic and political conditionality in the laws governing armed struggle; Ratio of forces as an immediate basis for the necessity (order) of armed conflict; Types of chance in armed conflict and their origins; Peculiarities in the dialectics of necessity and chance in armed conflict.

AD-622 242 Div. 18/7
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET AIR TACTICS. MATERIAL FROM SOVIET OPEN LITERATURE: SUMMARY OF DATA.
Rept. no. 1 on AID Work Assignment no. 67.
25 Jun 64, 97p. Rept. no. AID-U-64-66
TT , 65-64130

Unclassified report

Rept. on Translations of Soviet-Bloc Scientific and Technical Literature. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Military tactics, Airborne), (*Air Force, USSR), Armed forces (Foreign), Bombers, Fighters, Reconnaissance planes, Transport planes, Aerial warfare

The report was to be prepared as an annotated bibliography, but the sources used contain only short statements and indications related to the subject. Therefore, this report contains only fragmentary statements translated from the sources listed in the reference list. Some fragments as such seem to be unimportant to the subject, but they might be used for the description of the principles of Soviet air tactics. It should be mentioned that the reference list for this report is only a relatively small part of the Soviet sources dealing with the subject. The next report will contain further information on Soviet air tactics, including a detailed discussion of the principles of air tactics mentioned here in general form.

AD-622 027 See Fld. 12/1

AD-622 049 See Fld. 15/3

AD-622 062 See Fld. 1/2

AD-622 078 See Fld. 15/5

AD-622 108 See Fld. 15/3

AD-622 111 See Fld. 15/3

16. MISSILE TECHNOLOGY

AD-621 735 Div. 12/1 ,12/2
CFSTI Prices: HC $2.00 MF $0.50
BOSTON COLL CHESTNUT HILL MASS IONOSPHERIC RESEARCH LAB
ASPECT OF THE NIKE CAJUN AB 6.197 FIRED 27 OCTOBER 1964 FROM FORT CHURCHILL MANITOBA, CANADA.
Scientific rept.,
by Rene J. Marcou, John A. Sandock, and Brian F.Sullivan. 1 Jul 65, 50p. Rept. no. SR-2
Contract AF19 628 4178 Proj. 5710
AFCRL , 65-516

Unclassified report

Descriptors: (*Rocket trajectories, Attitude indicators), Telemetering data, Velocity, Angle of attack, Terrestrial magnetism, Magnetometers, Solar cells, Canada, Sounding rockets

The attitude of a rocket with respect to a geocentric coordinate system and a Fort Churchill coordinate system was determined. The analysis and reduction was based on data obtained from magnetometers and solar eyes mounted on the vehicle. The telemetered data consisted of magnetic field measurements from the spin and axial magnetometers and coded solar angle measurements from mutually perpendicular solar aspect eyes. (Author)

AD-621 805 Div. 12/3 ,18/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
PILOTLESS INTERCEPTORS.
Special trans.,
by P. Radchenko. 27 Nov 63, 5p. Rept. no. ATD-T-63-119a
TT , 65-64060

Unclassified report

Trans. from Krasnaya Zvezda (USSR) 16 Nov p1 1963.

Descriptors: (*Defense systems, USSR), (*Guided missiles (Surface-to air), USSR), Antiaircraft defense systems, Antimissile defense systems, Military training

An account is given of Russian long-range ground-to-air mmssile performance during training exercises.

AD-621 817 Div. 12/3 ,11/3 ,11/5 ,13/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET LITERATURE ON PROTECTIVE STRUCTURES AND COMPONENTS.
Rept. no. 5 on AID Work Assignment no. 13.
16 Jul 62, 22p. Rept. no. AID-62-101
TT , 65-64066

Unclassified report

Descriptors: (*Ground support equipment, USSR), Cargo vehicles, Railroad cars, Tankers, Hoists, Tanks (Containers)

This is the fifth of a series of reports reviewing Soviet literature on ground support equipment. The report deals with the following topics: Transport, trucks, railroad cars, and ships; Launch site accessories--gantries.

AD-622 194 Div. 12/1 ,5/2
CFSTI Prices: HC $3.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
RE-ENTRY COMMUNICATION STUDIES. COMPILATION OF ABSTRACTS,
by George Steblez. 10 Sep 65, 57p. Rept. no. ATD-P-65-73
TT , 65-64116
Unclassified report

Rept. on Surveys of Soviet Scientific and Technical Literature. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Re-entry vehicles, Communication systems), (*Communication systems, Atmosphere entry), Abstracting, Plasma physics, Magnetic resonance, Plasma sheath, Magnetohydrodynamics, Field theory, Plasma oscillations, Waveguides, Ionospheric propagation, Electromagnetic waves, Electron density, USSR

Abstracts are given for re-entry communication studies for the years 1960 through 1964, published in Soviet opensource literature.

AD-621 746 **See Fld. 22**

AD-621 804 **See Fld. 15/7**

AD-621 807 **See Fld. 5/9**

AD-621 808 **See Fld. 22**

AD-621 811 **See Fld. 6/16**

AD-621 861 **See Fld. 22**

AD-621 890 **See Fld. 15/5**

AD-622 081 **See Fld. 12/1**

AD-622 197 **See Fld. 6/17**

AD-622 272 **See Fld. 20/8**

AD-622 298 **See Fld. 5/10**

17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

AD-621 735 **See Fld. 16**

17/1. ACOUSTIC DETECTION

AD-621 982 **See Fld. 8/10**

AD-622 168 **See Fld. 5/9**

17/2. COMMUNICATIONS

AD-621 711 Div. 5/4 ,25/4
CFSTI Prices: HC $5.00 MF $1.00
GPL DIV GENERAL PRECISION INC PLEASANTVILLE N Y
WIDE ANGLE TELEVISION PROJECTION, VOLUME I.
Final engineering rept., Phases 1 and 2, Vol. 1,
by Louis P. Raitiere, and Urban H. Santone,Jr.,
Oct 64, 158p. Contract N61339 695
NTDC-PW , 695-1
Unclassified report

Descriptors: (*Fiber optics, Television equipment), (*Television equipment, Television cameras), Tests, Television display systems, Inconoscopes, Background, Visibility

The common objective of Phases I and II of the contract was to design, modify, construct, and arrange television equipments to provide a wide angle television system for viewing target and background information, and to adapt or modify commercially available equipment for electronically inserting the target information into the background. Reported in detail at this time is the development of the camera lens which provides an angle of view of 159 degrees in azimuth, and which is considered a significant achievement, and an examination of Fiber Optic Bundles. Phase III of the contract, presently in the study phase, to be reported upon completion of this Project, will deal with the design and construction of the combined system to project a wide angle TV picture for the realistic presentation of a trainee environment. (Author)

AD-621 934 Div. 5/5 ,30/2
CFSTI Prices: HC $7.00 MF $1.50
COMMUNICATION SYSTEMS INC FALLS CHURCH VA
ANALYSIS AND SIMULATION OF ADVANCED DCS SWITCHES. DCS AUTOVON SIMULATOR.
Final rept.
31 Aug 65, 317p. Rept. no. WCSI-65-TR-1008
Contract AF19 628 3414 Task DCA65 12
Unclassified report

Descriptors: (*Voice communication systems, Simulators), (*Switching circuits, Simulators), (*Simulators, Voice communication systems), Computers, Models (Simulations), Instruction manuals, Management engineering, Design, Analysis

The report summarizes the development of the AUTOVON Simulator and provides all information necessary for its use. Programmed for the Philco 2000 computer, this simulation tool is now in daily use at DCA for communication systems management and design evaluation. The AUTOVON (Automatic Voice Network) Simulator is a highly detailed computer model designed to provide quantitative measures of system performance resulting from proposed changes in traffic, routing, or configuration.

AD-622 117 Div. 5/1 ,6/6 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
IFF ACTIVE READOUT CONTROL AND DISPLAY SYSTEM.
Interim rept.,
by F. R. Fluhr. 3 Sep 65, 19p. Rept. no. NRL-6277
Proj. SF001 10 01 Task 6106
Unclassified report

Descriptors: (*Identification systems, Radar equipment), (*Plan position indicators, Correlation techniques), (*Radar range computers, Display systems), (*Data processing systems, Combat information centers), Target recognition, Radar, Azimuth gating, Range gating, Computer logic, Radar tracking

An IFF active readout control and display system using majority logic and PPI position correlation techniques is being developed in the Data Processing Branch. Up to five target responses in each interrogated mode are stored, and majority-voting logic determines the confidence of the stored returns in each mode. So long as a gated target's interrogation responses are present during one scan, the numerical processing continually attempts to increase the confidence of the stored returns. The position correlation techniques point out the location of the responding target on the PPI. A true range and azimuth video gate technique, which can work with analog or digital PPI sweeps, has been devised. This video gate technique works in conjunction with the PPI retrace insertion method employed. (Author)

AD-622 198 Div. 5/1 ,6/6 ,30/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
OPERATION AND PERFORMANCE OF THE NRL SATELLITE POSITION DISPLAY,
by H. G. Talmadge,Jr., and R. J. Orsino. 11 Aug 65, 32p. Rept. no. NRL-6219
Proj. SF019 01 03 ,RF007 01 41 4450 Task 6168
Unclassified report

Descriptors: (*Space surveillance systems, Display systems), (*Satellites (Artificial), Position finding), (*Display systems, Space surveillance systems), (*Position finding, Space surveillance systems), Naval research, Shipborne, Data storage systems, Information retrieval, Digital computers, Maps, Orbital trajectories, Mathematical prediction, Combat information centers, Command + control systems

Nearing completion at NRL is an experimental Satellite Position Prediction and Display equipment (SPAD) for shipboard use. SPAD will store orbital elements and related information of 88 satellites in a digital computer, which then will predict and display positions and other information on up to eleven satellites. Position and height information is updated on the 19-in geographic display each 1.1 sec. The prediction time can be varied forwards or backwards to permit a rapid determination of where and when different configurations of satellite orbits, for instance, satellite grouping, will occur. An orbit with a granularity of four degrees in both latitude and longtitude can be computed in just five seconds. The operational program, prepared for the AN/UYK-1 digital computer, takes into account the variation of anomalistic periods of irregular satellites. Thus, positions of decaying satellites have been printed on the tabular readout with position errors of as much as 0.2 deg in latitude or longitude at nine days from epoch. A surveillance circle up to 504 naut mi in radius for one selected satellite can be painted on the expanded display. Course, speed, and position of own ship are displayed at all times. (Author)

AD-621 870 **See Fld. 17/7**

AD-621 922 **See Fld. 20/6**

AD-622 162 **See Fld. 5/10**

17/2.1 RADIO COMMUNICATIONS

AD-621 942 Div. 5/2
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
EARTH-TO-SPACE COMMUNICATIONS AT MILLIMETER WAVELENGTHS.
Physical sciences research papers,
by Edward E. Altshuler. Aug 65, 42p. Rept. no. AFCRL-65-566 ,PSRP-125
Proj. 4600 Task 460009
Unclassified report

Descriptors: (*Space communication systems, Millimeter waves), Attenuation, Atmospheric refraction, Ionospheric propagation, Meteorological parameters, Masers, Radiometers, Antennas

It is expected that with the exploration of outer space, a requirement for high data rate earth-to-space communication channels will arise. A program to investigate the feasibility of using the millimeter-wave region of the spectrum for this application is presented. The theory of atmospheric attenuation resulting from losses due to absorption, scattering and refraction processes is reviewed and used to estimate propagation losses produced by atmospheric gases, clouds and precipitation. Curves of total atmospheric attenuation and noise level as a function of meteorological parameters and antenna elevation angle are also presented. A series of experiments designed to obtain as much information as possible on the limitations imposed by the atmosphere on millimeter-wave propagation is considered. Although experiments using natural celestial bodies such as the sun, moon, planets and galaxies as radio sources are emphasized, those which would utilize aircraft, rockets and satellites are also mentioned. Finally, the characteristics of a recently installed precision 29-ft antenna designed to operate at 35 Gc (wavelength = 8.6 mm) with a traveling-wave maser as a preamplifier for the radiometer are outlined along with the specific experiments for which this antenna system will be used. (Author)

AD-622 069 Div. 5/2 ,30/2
MOTOROLA INC CHICAGO ILL COMMUNICATIONS DIV
DATA TRANSMISSION INVESTIGATION. (SHORT RANGE HF RADIO DATA TRANSMISSION).
Quarterly progress rept. no. 2, 4 Apr-3 Aug 65,
by Roger F. Salava. 3 Aug 65, 39p. Contract DA28 043AMC00478E Task 1E6 34301D246 09 03
Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale. See also AD-615 975.

Descriptors: (*Radio communication systems, Data transmission systems), (*Data transmission systems, Radio communication systems), High frequency, Propagation, Attenuation, Phase studies, Environmental tests, Multipath transmission, Magnetic recording systems, Bandwidth, Digital systems

The data reduction phase of the data transmission program is discussed using sample field test results. The field tests include: (1) data transmission tests, (2) phase measurement tests to define the coherency of the short range HF path, (3) fade measurement tests of several CW tones to define the rate, depth, and degree of frequency selective fading and (4) multipath tests to aid in determining the severity of multipath. The field test system is described and the recording format for each of the tests is discussed. An incremental magnetic tape recorder is used in the test system and the recording format has been designed to permit direct entry of the recorded data into a computer for analysis. (Author)

AD-622 060 **See Fld. 5/9**

AD-622 119 **See Fld. 4/2**

AD-622 194 **See Fld. 16**

17/7. NAVIGATION AND GUIDANCE

AD-621 673 Div. 19/3 ,30/3 ,1/5
CFSTI Prices: HC $4.00 MF $1.00
AIRBORNE INSTRUMENTS LAB DEER PARK N Y
NEW BASIC FLIGHT INSPECTION SYSTEM.
Final rept.,
by J. A. Lovell, J. P. Bethel, J. G. Kahan, and R. O. Steen. Mar 65, 128p. Contract FA64WA5164 Proj. 341 001 01N SRDS , RD-65-37
Unclassified report

Descriptors: (*Flight testing, Navigational aids), (*Navigational aids, Flight testing), (*Aviation safety, Navigational aids), (*Aeronautics, Navigational aids), Airborne, Monitors, Test equipment (Electronics), Radio navigation, Calibration, Instrument landings, Glide path systems, Civil aviation

A program was conducted to design an airborne system for FAA flight inspection of navigation-aid facilities. The design was concerned with all common-system navigation aids; however, those of major concern were VOR, TACAN, VORTAC, ILS Localizer, and ILS Glide Slope. The system design had the goal of eliminating subjective judgement, human error, and instrumentation error wherever possible. This required abandoning the concept of facility evaluation from the standpoint of specific users of the signals, and replacing it by measurements based upon objective scientific principles. The design makes use of a display and recording approach that presents the significant data in a clear and uncluttered way for inflight use. However, the capability to recognize small irregularities quickly is retained and means are included to explore and analyze data in detail either in flight as it is being received or after the flight.

AD-621 677 Div. 19/5 ,19/3
CFSTI Prices: HC $3.00 MF $0.75
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY N J RESEARCH DIV
VLF MULTI-RANGE NAVIGATION-FIX ERROR CONTOURS.
Final rept.,
by Ronald Braff, and Nathaniel Braverman. May 65, 64p. Proj. 350 105 02R SRDS , RD-65-70
Unclassified report

Descriptors: (*Navigational aids, Very low frequency), Loran, Position finding, Radio navigation, Errors, Statistical analysis, Navigation

A study was made of the accuracy and coverage of longdistance navigation systems which employ very-low-frequencies (in the range from ten to fourteen kilocycles per second) and which are based upon the determination of the distances from the vehicle to two or three ground-based stations. The fix error (actually precision), for such systems, may be expressed statistically in terms of the precise bivariate equi-probability error density ellipse or by the simpler, but conservatively approximate, drms circle. This error is a function of the 'angles of cut' of the lines of position, the standard deviation of the errors in determination of the distances (ranges) to the stations, and the degree of correlation of these distance determinations. An analysis is made of the errors which occur in a range determination. Estimates, applicable when computing constant-error contours (isograms), are given. Error isograms are available for the two-station case but are based on a flat earth approximation. Proposed VLF systems would employ long baselines where the flat earth approximation is shown to cause appreciable discrepancies. The equations for the constant-error contours are derived (based on a spherical earth) as a function of baseline length (and orientation where three stations are used) and the 'angles of cut' of the lines of position. Various error isograms were computed and plotted through the use of a digital computer. A number of examples are presented. A method for determining the area covered acceptably by two stations is given and three-station coverage characteristics are discussed. (Author)

AD-621 730 Div. 19/4 ,30/3
CFSTI Prices: HC $1.00 MF $0.50
MARTIN-MARIETTA CORP ORLANDO FLA PHYSICAL SCIENCES RESEARCH LAB
CHARGED PARTICLE ACCELEROMETER.
Quarterly technical memo. rept. no. 1, May-20 Aug 65,
by O. R. Kyler, F. F. Schloetzer, and W. G. Zinn. Sep 65, 25p. Rept. no. Martin OR-6725 Contract NOw65 0419c
Unclassified report

Descriptors: (*Accelerometers, Charged particles), (*Charged particles, Accelerometers), Photoelectric cells (Semiconductor), Particle trajectories, Servomechanisms, Vacuum apparatus

This report describes the investigations of charged particle accelerometers conducted by Martin-Orlando. The purpose of this program is to develop a charged particle accelerometer capable of sensing linear acceleration. The effort consisted of: 9 (1) evaluation of chamber material on linearity for a three-axis modulated carrier accelerometer; (2) evaluation of heat from light source on internal acceleration; (3) evaluation of photoconductive cells for a dc accelerometer; (4) insertion of particles in a vacuum; and (5) preliminary evaluation on a digital force balance loop. (Author)

AD-621 870 Div. 19/5 ,31/9 ,31/4 ,5/1
CFSTI Prices: HC $4.00 MF $0.75
HONEYWELL INC ST PAUL MINN SYSTEMS AND RESEARCH DIV
EXPERIMENTAL EVALUATION OF SYMBOLIC AND PICTORIAL DISPLAYS FOR SUBMARINE CONTROL.
Final rept.,
by Robert C. McLane, and James D. Wolf. 30 Sep 65, 119p. Rept. no. 1550-FR1 Contract Nonr367500 Proj. NR196 025
Unclassified report

Descriptors: (*Submarines, Underwater navigation), (*Display systems, Underwater navigation), (*Underwater navigation, Display systems), Analog systems, Submarine simulators, Control systems, Underwater tracking, Command + control systems, Weapon systems, Nuclear powered vessels, Human engineering, Reaction (Psychology), Reflexes, Feasibility studies

The Navy has given extensive support to the development of several different integrated display concepts for nuclear submarines. This report describes a research program through which comparative, empirical analyses of these concepts was accomplished and aid was provided in selection of the most promising approach from a systems effectiveness viewpoint. The experiments established guidelines for use of these integrated displays in vehicle control including monitoring and mission plan revision as a function of external constraints such as attacking weapons systems. The experimental approach employed tests designed to reveal differences which have practical significance to the Navy; by measuring tracking performance with and without forced sampling or blanking; recording reaction, judgment, and decision times; and determining correctness of decisions on problems requiring interpretive judgment, evasive maneuvers, and return to the pre-problem tracking task. (Author)

AD-621 704 **See Fld. 14/2**

AD-621 706 **See Fld. 13/10**

AD-621 773 **See Fld. 20/6**

AD-622 007 **See Fld. 5/10**

17/8. OPTICAL DETECTION

AD-621 651 **See Fld. 6/16**

AD-621 979 See Fld. 20/6

AD-622 268 See Fld. 20/6

17/9. RADAR DETECTION

AD-621 716 Div. 6/6
CFSTI Prices: HC $4.00 MF $1.00
RADIO CORP OF AMERICA MOORESTOWN N J MISSILE AND SURFACE RADAR DIV
OPTIMUM RADAR SURVEILLANCE MODE STUDY PROGRAM.
Final rept. for Apr 64-Feb 65,
by Harold M. Finn. Sep 65, 147p. Contract AF30 602 3152 Proj. 4506 Task 450601
RADC , TR-65-77
Unclassified report

Descriptors: (*Radar transmitters, Optimization), Radar scanning, Search radar, Effectiveness, Radar equipment, Radar antennas, Phased arrays, Correlators

A second-phase study of radar multiple-stage decision processors which minimize the average transmitter power and data processing costs for performing the surveillance mission are described. Energy Variant Sequential Detector (EVSD) theory is reviewed. A sequential detection scheme for performing high-resolution surveillance missions where relatively large time-bandwidth products are involved is described. These modes (designated as Resolution-Variant EVSD's) use the programmed control of the time-bandwidth product of the transmitted signal, the transmitted energy, and the receiver thresholds on the sequential steps employed in order to minimize both the transmitter power and the parallel signal processing costs. General implementation of EVSD's are reviewed. The optimum scan time to be used when EVSD's are employed for each scan look is developed for both the case where the target is pointing directly at the radar, and the second case where the target range is assumed relatively constant for the time duration in the surveillance volume. EVSD modes which include an option on the time interval between sequential steps are described, and the additional power savings over the use of a conventional EVSD are computed.

AD-621 745 Div. 6/6 ,8/2 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
ELCON LAB INC PEABODY MASS
HIGH POWER MAGNETICALLY CONFINED PLASMA DUPLEXER.
Quarterly rept. no. 8 on Proj. DEFENDER, 1 Mar31 May 65,
by Edwin Langberg, and William Ghen. 31 May 65, 40p. Contract DA36 039AMC02364E Proj. arpa order 426 Task DA7900 21 223 01 00
Unclassified report

See also AD-426 269.

Descriptors: (*Radar duplexers, Plasma medium), (*Plasma medium, Containment), Magnetic pinch, Cavity resonators, Electic fields, Dielectrics, Fibers, Microwave equipment

Three methods of reducing the recovery time of the magnetically confined plasma duplexer are investigated. One method, the use of a plasma tuned cavity, is partially successful, but is too complicated to be practical. A second method using d.c. sweeping electric fields is unsuccessful. A third method, using thin dielectric fibers to reduce the average ambipolar diffusion distance in the plasma is a satisfactory compromise solution to the problem of achieving an acceptable recovery time and having a very effective confining magnetic field. (Author)

AD-621 830 Div. 6/6 ,8/5 ,2/7
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
PHASE MODULATION IN LOW POWER TELEMETRY. (LA MODULATION DE PHASE EN TELEMETRIE DE BASSE PUISSANCE).
Rept. on Communications, Electronics, and Automation,
by J. K. Pulfer, and G. L. Terreault. Jul 65, 4p.
Rept. no. EIC-65-CE+A-3
Unclassified report

Pub. in Transactions of the Engineering Inst. of Canada (Copies available only to DDC users). Text in French.

Descriptors: (*Telemeter systems, Sounding rockets), (*Phase modulation, Telemeter systems), Upper atmosphere, Aurorae, Demodulation, Telemetering transmitters, Telemetering receivers, Electron density, Canada

Studies were made of the upper atmosphere using Black Brant rockets launched from Churchill Research Range on the Hudson Bay. Ion density and electron temperature inside auroral plasmas are determined. Collected data are transmitted to earth by a radio-telemetry link. It is found that for precision measurement the power of the radio trnasmitter must be reduced to limit the electromagnetic field around the probe. The problem then is to construct a high quality telemetry network between the probe and the terrestrial station.

AD-621 915 Div. 6/6
CFSTI Prices: HC $4.00 MF $0.75
SPERRY MICROWAVE ELECTRONICS CO CLEARWATER FLA
DEVELOPMENT OF C-BAND FERRITE DUPLEXER.
Technical rept. no. 4 (Final), 1 Nov 63-15 May 65,
by J. E. Andrews, J. R. Brediger, and J. Brown. 15 May 65, 102p. Contract DA36 039AMC03394E Proj. DA1G6 22001A055 04
Unclassified report

Descriptors: (*Radar duplexers, C band), Limiters, Ferromagnetic materials, Waveguide circulators, Semiconductor devices, Broadband, Resonance, Solid state physics

The development of a C band, all solid state radar front end utilizing high quality state-of-the-art ferrite devices, completely passive in nature, and serving as a (fail-safe) duplexer-limited with the option of frequency preselection is presented. The duplexers consist of a 4 port singlejunction circulator and associated limiters. The ferrite limiter assembly is made up of a waveguide subsidiary resonance limiter with a dual-sphere, broadband, gyromagnetic coupling limiter or a single-sphere, narrow band, gyromagnetic coupling limiter and a varactor cleanup limiter. The theory and development of the circulator and limiter are discussed in detail. The circulator consists of ferrimagnetic disks placed at the center of a coplanar 90 degrees, WR187 waveguide junction. The ferrimagnetic disks are biased close to resonance and support circulation to one adjacent port while isolating all others. The dualsphere limiter is constructed in strip transmission line and utilizes both first and second order limiting processes to obtain the desired dynamic range and low level limiting threshold. Gyromagnetic coupling techniques and modern network synthesis have been employed to obtain the instantaneous bandwidth of greater than 10 percent. Final high power and low power test results are reported and analyzed. (Author)

AD-621 995 Div. 6/6 ,26/6 ,8/1
CFSTI Prices: HC $3.00 MF $0.75
GENERAL ELECTRIC CO SYRACUSE N Y HEAVY MILITARY ELECTRONICS DEPT
STRUCTURAL STUDY OF AN/FPS-24 PEDESTAL.
Final rept.,
by H. D. Barnhart, J. M. McGrew, and E. Lange. Sep 65, 84p. Rept. no. EH-61655
Contract AF30 602 3567
RADC , TR-65-247
Unclassified report

Descriptors: (*Ball bearings, Load distribution), (*Radar antennas, Ball bearings), Antifriction bearings, Structures, Mathematical analysis, Loading (Mechanics), Life expectancy, Antenna components

Results are presented from an investigation of the load distribution to the main azimuth bearing of the AN/FPS-24 radar. The bearing is a 10-ft diameter 4-point contact bearing subjected to thrust, radial, and overturning loads. Actual static ball loads were determined in a field test. Bearing life calculations based on the measured loads and compared with theoretical calculations are presented. The feasibility of making dynamic measurements of ball loads under actual rotation condition was proven. (Author)

AD-622 085 Div. 6/6 ,28/1
TRACOR INC AUSTIN TEX
A PERFORMANCE-ORIENTED APPROACH TO DETECTION: TABLES FOR DETECTION, DISCRIMINATION, AND DECISION THEORY,
by Anne Blocker Blosser. Aug 65, 76p. Rept. no. TRACOR-65-267-U
Contract NObsr93140
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is not available for public sale.

Descriptors: (*Signals, Detection), (*Detection, Decision theory), Target discrimination, Performance (Human), Tables

AD-621 630 See Fld. 20/6

AD-621 979 See Fld. 20/6

AD-622 007 See Fld. 5/10

AD-622 117 See Fld. 17/2

AD-622 198 See Fld. 17/2

18/2. ISOTOPES

AD-621 958 See Fld. 20/4

18/4. NUCLEAR INSTRUMENTATION

AD-621 666 Div. 20/6
HARVARD UNIV CAMBRIDGE MASS CYCLOTRON LAB
PROCESSES FOR OBTAINING CONDUCTING AREAS ON THIN FILMS: APPLICATION IONIZATION CHAMBERS,
by D. F. Measday. 31 Mar 65, 2p.
Unclassified report

Pub. in Review of Scientific Instruments v36 n8 p1263-4 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ionization chambers, Metal films), (*Metal films, Plating), (*Neutron beams, Radiation monitors), Electrical conductance, Neutron counters

AD-621 791 Div. 20/6 ,20/5
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
RESEARCH ON RADIATION SHIELDING,
by U. Canali, W. Matthes, R. Nicks, N. Papmehl, and H. Penkuhn. 1964, 23p. Rept. no. SORIN-53

Unclassified report

Pub. in EURATOM'S Scientific Activities, Joint Nuclear Research Center Ispra Establishment p87-108 1964.

Descriptors: (*Reactor shielding materials, Nuclear particles), Neutron transport theory, Gamma-ray absorption coefficients, Neutron flux, Fast neutrons, Thermal neutrons, Transport properties, Partial differential equations, Water, Lead, Iron, Italy

An analytical method of treating energy-dependent neutron transport problems is discussed. Solutions are found by expanding the angular neutron flux in eigenfunctions of the energy transfer operator. Integral representation of the solution instead of a series expansion is given. A numerical method for the integration of the Boltzmann transport equation for gammas is described. The results of a monoenergetic collimated beam incident on a slab of Fe and Pb are given. Build-up factors are compared with those given by Goldstein. Experimental work was carried out in fast neutron propagation in water. Monoenergetic neutrons were produced by a 5.5 Mev Van de Graaf accelerator. Water and oxygen removal cross-sections as a function of energy are given. Neutron penetration in ducts surrounded by water was investigated. The neutron source was a natural uranium convertor plate. Fast and thermal neutron flux profiles on the axis of the cylindrical ducts were measured with threshold and resonance detectors. Asymptotic slopes of fast neutron profiles are given. (Author)

18/8. RADIOACTIVITY

AD-621 646 Div. 20/3 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
RESEARCH ON ULTRASONIC ATTENUATION.
Progress rept. no. 1, 1 May-31 Jul 55.
31 Jul 55, 2p. Contract AF33 616 3019

Unclassified report

Descriptors: (*Dielectrics, Radiation damage), (*Neutron reactions, Radiation damage), Glass, Thermal neutrons, Attenuation, Boron, Alpha particles, Gamma rays

The aim of the work is to determine whether it is possible and practical to observe the integrated effects of slow neutron bombardment on solid materials sensitive to slow neutron effects. The aim of the investigation is to attempt to find a material or materials sensitive to slow neutron effects but insensitive to gamma ray irradiation.

AD-622 019 Div. 20/3 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
DETERMINATION OF THE TOTAL TRITIUM ACTIVITY ABSORBED ON THE SURFACE OF VARIOUS METALS,
by W. R. Balkwell, and D. A. Kubose. 19 Aug 65, 20p. Rept. no. USNRDL-TR-890
Proj. SF011 01 03 Task 11275

Unclassified report

Descriptors: (*Tritium, Absorption), (*Radiological contamination, Tritium), (*Metals, Radiological contamination), Steel, Brass, Aluminum, Surface properties, Radioactive isotopes

The total tritium activity absorbed on structural steel, galvanized steel, brass and aluminum was found to be less than 10 micro-c of tritium/sq cm of surface for exposure concentrations of 0.23 mc of tritium/cu cm in air and an exposure time of one hour. Tot total tritium activity adsorbed on a carbon steel surface is much greater than for the other surfaces. An increase in the total tritium activity adsorbed with increasing tritium exposure concentration was observed for all the metals studied. The nature of this increase, assuming a clean surface, appears to depend on the surface texture of the material. At a constant exposure concentration (0.11 mc of tritium/cu cm) no significant change in the total tritium activity adsorbed was observed for exposure times from 15 min to 4 hr. (Author)

18/9. REACTOR ENGINEERING AND OPERATION

AD-621 815 Div. 20/5 ,25/8 ,15/1
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
A VARIABLE-LATTICE DIFFERENCE SOLUTION OF AN INITIAL-VALUE PROBLEM FOR THE CYLINDRICAL HEAT EQUATION,
by A. A. Ascari, and T. Zucca. 10 Nov 64, 12p.

Unclassified report

Pub. in Calcolo v2 n2 p177-87 Apr-Jun 1965 (Copies available only to DDC users).

Descriptors: (*Reactor kinetics, Partial differential equations), (*Partial differential equations, Heat transfer), Diffusion, Reactor lattice parameters, Boundary value problems, Difference equations, Cylindrical bodies, Numerical methods and procedures, Italy

The difference solution of a diffusion problem for an infinite cylinder (with axial symmetry) was obtained by means of a lattice with constant number of space mesh points and variable mesh width: the lattice is initially concentrated in a surface shell, according to the initial distribution, and is expanded as the physical uniformization proceeds. (Author)

AD-621 867 Div. 20/5 ,17/5
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
IRRADIATION EFFECTS ON REACTOR STRUCTURAL MATERIALS.
Quarterly progress rept. for 1 May-31 Jul 65,
by L. E. Steele, J. R. Hawthorne, C. Z. Serpan Jr., H. E. Watson, and E. P. Klier. 15 Aug 65, 49p.
Rept. no. nrl memo. rept. ,1638
Contract AT49 5 2110 Proj. RR007 01 46 5409,SR007 01 01 Task 0858

Unclassified report

Descriptors: (*Reactor materials, Steel), (*Steel, Radiation damage), (*Radiation damage, Reactor materials), Brittleness, Ductility, Nickel alloys, Chromium alloys, Molybdenum alloys, Stresses, Tensile properties, Pressure vessels, Machining, Remote control systems, Structural parts

The report includes the following: (1) comparative radiation sensitivity of specially prepared heats of A302-B steel, (2) combined effects of temper embrittlement and radiation on Ni-Cr-Mo steels, (3) problems in assessing the notch ductility of a 2-1/4Cr-1Mo Q and T steel, (4) effects of applied stress during irradiation on the notch ductility of A350-LF1 (Modified) steel, (5) remote equipment and initial results on tensile properties of several irradiated structural steels, (6) radiation damage surveillance of reactor pressure vessels of the Big Rock Point and the Army SM-1A reactors, and (7) remote machining operations in the NRL High Level Radiation Laboratory. (Author)

AD-621 791 See Fld. 18/4

AD-621 860 See Fld. 20

AD-622 200 See Fld. 20/8

19/1. AMMUNITION, EXPLOSIVES, AND PYROTECHNICS

AD-621 772 Div. 22/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DIRECTED THROWING OF BODIES BY EXPLOSION PRODUCTS,
by G. M. Lyakhov. 30 Aug 65, 17p. Rept. no. FTD-MT-65-156
TT , 65-64038

Unclassified report

Edited machine trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n3 p44-52 1962. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Explosion effects, Projectiles), (*Projectiles, Armor piercing ammunition), Shaped charges, Fragmentation ammunition, Charges (Explosive), USSR

During explosion of charge of explosive having on its surface a deep recess covered by a thin metallic facing, there occurs collapse of facing with formation of a cumulative jet and rammer. Results are given of investigation of explosion of charges with small depth of recess. It was determined that in this case the facing turns inside out and is destroyed, with formation of a directed flow of its elements. There is experimentally investigated motion of these elements; there are determined conditions under which there can be applied the theory of one-dimensional motion, to directed throwing of bodies; there is considered unidirectional and biodirectional throwing. There is determined quantitative relation between parameters of the charge and characteristics of the flow. (Author)

AD-622 195 See Fld. 19/4

AD-622 199 See Fld. 15/5

19/4. EXPLOSIONS, BALLISTICS, AND ARMOR

AD-621 710 Div. 22/6 ,15/1
CFSTI Prices: HC $3.00 MF $0.75
DREXEL INST OF TECH PHILADELPHIA PA
SOLUTION OF BLAST WAVES BY THE METHOD OF CHARACTERISTICS,
by Pei Chi Chou, and Robert R. Karpp. Sep 65, 66p. Rept. no. DIT-125-7
Contract DA36 034ORD3672RD

Unclassified report

Descriptors: (*Shock waves, Numerical analysis), Numerical methods and procedures, Blast, Ballistics

The numerical method of characteristics is applied to the plane, cylindrical, and spherical blast wave problems. The calculation begins at a constant time line within the blast wave. Along this line, all three flow variables are prescribed according to the similarity solution. Along a fixed back boundary, which lies between the shock front and the time-axis, one flow variable is prescribed. On the other boundary, the strong shock equations apply. When compared to the exact similarity solu-

tion, the results of the method of characteristics are found to be accurate to within 1%, for all variables along the shock front, after a pressure drop of 99%. Also, h (2)-type extrapolation of calculated results always improves the accuracy, whereas the h-type extrapolation may not. (Author)

AD-622 195 Div. 22/4 ,22/1
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET AEROBALLISTIC RANGES AND HYPERVELOCITY RESEARCH: COMPREHENSIVE REPORT,
by Lee Boylan. 21 Sep 65, 71p. Rept. no. ATD-P-65-79
TT , 65-64117
Unclassified report

Rept. on Surveys of Communist World Scientific and Technical Literature. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ranges (Establishments), Exterior ballistics), (*Exterior ballistics, Ranges (Establishments)), (*Hypervelocity guns, USSR), Impact prediction, Hypervelocity projectiles, Shock tubes, Instrumentation, Bibliographies, Poland

Part I deals predominantly with two ballistic ranges mentioned in open Soviet literature as being presently in use in the Soviet Union. Other material discussed in Part I deals with several recent articles describing methods of obtaining extremely high velocities (100 and 90 km/sec). This material covers recent Soviet and Polish developments in hypervelocity technology. Part II discusses Soviet impact technique, trends, and equipment, and contains some material on impact studies. Of particular interest is a recent article discussing a 15-km/sec impact achieved by using what is described as a 'multistage' explosive charge. At the end of Part II, a selected bibliography has been included which cites the English translations of many of the foremost Soviet works dealing with impact. Parts III and IV briefly discuss Soviet shock tubes and instrumentation, listing some of the components most frequently found in Soviet hypervelocity studies. The material covered in this report is the result of an exhaustive and comprehensive search of more than 15 major Soviet scientific periodicals and other pertinent serials, monographs, etc., published over the last seven years, and involved the review of over 3000 articles. (Author)

AD-622 281 Div. 22/6 ,9/1
CFSTI Prices: HC $1.00 MF $0.50
BUREAU OF MINES PITTSBURGH PA EXPLOSIVES RESEARCH CENTER
STRESS WAVES IN BOUNDED MEDIA.
Quarterly rept. no. 3, 1 Jun-31 Aug 65,
by Richard W. Watson, Karl R. Becker, and Frank C. Gibson. 12 Oct 65, 15p.
Unclassified report

See also AD-617 195.

Descriptors: (*Explosive materials, Containers), (*Shock waves, Detonations), (*Energy management, Detonations), (*Detonations, Energy management), Ballistics, Stresses, Detonation waves, TNT, Liquids, Aluminum, Magnesium, Copper, Lead, Cavity liners

A program was initiated to determine the factors important in controlling the energy coupling between a detonating explosive and a metallic liner. A number of preliminary experiments using a slab explosive-liner geometry were completed with several different explosives combined with four different liner materials. These combinations were chosen as representing a wide range in the impedance match between the explosive and liner. Additionally, the explosives used in these experiments had different critical diameters for sustained detonations--implying different reaction zone structures-thus permitting some estimate of the effects of zone structure on the energy transfer from explosive to the liner. The results of these preliminary investigations are presented in this report.

AD-621 868 **See Fld. 19/7**

19/7. ROCKETS

AD-621 868 Div. 22/11,22/4
CFSTI Prices: HC $3.00 MF $0.75
FRANKFORD ARSENAL PHILADELPHIA PA SMALL CALIBER ENGINEERING DIRECTORATE
PERFORMANCE ANALYSIS OF DAVIS GUN LAUNCHERS FOR VEHICLES.
Memorandum rept.,
by Sidney Goldstein. Aug 65, 63p. Rept. no. M66-3-1
Proj. DA15531501D338
Unclassified report

Descriptors: (*Rocket launchers, Interior ballistics), (*Launching, Interior ballistics), (*Interior ballistics, Launching), Performance (Engineering), Vehicles, Gun launched, Gun barrels, Recoilless guns

A set of interior ballistic equations is derived for a reactionless type of launcher of the Davis Gun type in which two masses are ejected from a common chamber. Based on ballistic analysis of the Davis Gun launcher it appears feasible that a high performance type Davis Gun launcher could be effectively used from a vehicle. (Author)

19/8. UNDERWATER ORDNANCE

AD-621 706 **See Fld. 13/10**

20. PHYSICS

AD-621 860 Div. 20/9 ,20/5 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
AVCO EVERETT RESEARCH LAB EVERETT MASS
THE PRODUCTION OF BEV POTENTIAL WELLS,
by G. S. Janes, R. H. Levy, and H. E. Petschek. Jun 65, 9p. Rept. no. AMP-166
Contract AF49 638 1553 ,NASw1101
Unclassified report

Descriptors: (*Ion sources, Plasma medium), (*Potential theory, Electrostatic fields), (*Electrons, Plasma medium), Voltage, Ion accelerators, Space charges

It may be possible to produce large electrostatic potential wells by a method which avoids the usual breakdown limitations. The well would by produced by a cloud of electrons suspended in a magnetic field. Estimates presented suggest that the Bev range may be accessible with large equipment. Ions introduced into the potential well would be both accelerated and contained. If the number of ions which can be contained in this way is limited by the accumulation of positive space charge, it would be possible to produce an overall reaction rate of the order of 10 to the 16th power nuclear reactions per second.

20/1. ACOUSTICS

AD-621 634 Div. 25/1 ,1/1 ,33/1
CFSTI Prices: HC $6.00 MF $1.25
MICHIGAN UNIV ANN ARBOR ACOUSTICS AND SEISMICS LAB
EXPERIMENTAL STUDY OF SOUND POWER RADIATED FROM COLD MODEL JETS AND GROUND SILENCING ARRANGEMENTS. VOLUME I.
Technical rept.,
by Norman E. Barnett. 4 May 65, 216p. Rept. no. 05478-6-F
Contract AF33 657 8802 Proj. 8170 Task 817001
APL , TR-65-55 V1
Unclassified report

Descriptors: (*Jet engine noise, Countermeasures), Model tests, Nozzles, Configuration

An experimental and exploratory study of radiated sound power has been conducted with cold model jets and various additions to those jets. The objective was to provide insight into the physical acoustical problems related to the design of ground runup silencers for use with advanced jet aircraft. The results demonstrate the complexity of this silencing problem and indicate how the radiated sound power from a given jet can be increased or decreased through several orders of magnitude. The results indicate that various features common to current muffler hardware must act to increase rather than decrease noise with consequent limitation to the silencing obtainable. Further results suggest how to proceed more directly with silencing. A complete exploration of methods and parameters has not been possible and thus additional research is needed to yield all of the insight that can be provided by study of model jets. (Author)

AD-621 831 Div. 25/1 ,25/8
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
TEMPERATURE AND FREQUENCY DEPENDENCE OF ULTRASONIC ABSORPTION IN LIQUID HELIUM BELOW 1K,
by W. A. Jeffers,Jr., and W. M. Whitney. 24 Mar 65, 16p.
Unclassified report

Pub. in Physical Review v139 n4A pA1082-96 Aug 16 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ultrasonic radiation, Absorption), (*Liquefied gases, Acoustic properties), (*Helium, Liquefied gases), Cryogenics, Phonons, Thermal conductivity, Temperature, Attenuation, Thermometers, Cryostats

From measurements of the temperature dependence of the amplitude of ultrasonic pulses propagated over a fixed path in liquid helium, the attenuation coefficient has been determined at the six frequencies 1.00, 2.02, 3.91, 6.08, 10.2, and 11.7 Mc/sec, at temperatures extending down to 0.2K. Below 0.6K, the observed variation of the absorption coefficient a (1/cm) with frequency f (Mc/sec) and temperature T (K) can be represented by the empirical equation a=0.11 (f to the 2/3 power) (Tcubed). This behavior differs from that predicted by several existing theories that are based upon the threephonon or four-phonon interaction between longitudinal acoustic quanta and thermal phonons. Over the temperature interval 0.6-0.8K, the measured attenuation is somewhat greater than would be expected from an extrapolation of the results below 0.6K into this temperature region. A comparison of the data with some calculations by Khalatnikov suggests that the additional absorption arises from thermal conduction in the normal fluid. An equation that is analogous to the classical Kirchhoff expression adequately accounts for this contribution to the total absorption, even at temperatures for which the lifetime of the thermal phonons exceeds the period of the sound wave. (Author)

AD-621 841 Div. 25/1 ,25/4 ,26/1
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
REFLECTION OF GIGACYCLE-PER-SECOND UNTRASONIC WAVES FROM AN OPTICAL-CONTACT BOND.

Physical sciences research papers,
by Paul H. Carr. Sep 65, 10p. Rept. no. PSRP-132 ,AFCRL-65-662
Proj. 4600 Task 460003
Unclassified report

Pub. in Journal of Acoustical Society of America v37 n5 p927-8 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ultrasonic radiation, Reflectors), (*Optical phenomena, Bonding), (*Bonding, Optical phenomena), Bonded joints, Quartz, Rods, Acoustic impedance, Transducers, Acoustics

The use of optical contact as a low-loss acoustic bond at gigacycle-per-second frequencies has been demonstrated. The reflection of 3- and 9-Gc/sec longitudinal waves from an optical-contact bond between two X-cut quartz rods has been measured to be of the order of 1% of the incident acoustic power at 1.5K. Thin X-cut quartz disks optically contacted to Z-cut quartz and ruby rods have been used at 1.5K and found to be about as efficient as an X-cut rod. (Author)

AD-621 933 Div. 25/1 ,25/8
RAYTHEON CO WALTHAM MASS RESEARCH DIV
KINETIC THEORY OF SOUND PROPAGATION IN RAREFIED GASES,
Revised ed.,
by David Kahn, and David Mintzer. 5 Nov 64, 13p.
Unclassified report

Pub. in Physics of Fluids v8 n6 p1090-1102 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Northwestern Univ., Evanston, Ill. Technological Inst. Revision of manuscript received 11 Jul 1963.

Descriptors: (*Kinetic theory, Sound transmission), (*Sound transmission, Gases), Differential equations, Series, Polynomials, Absorption, Transport properties

The problem of sound propagation in highly rarefied monatomic gases is investigated from the point of view of general orthogonal polynomial solutions (in velocity space) of the Boltzmann equation. It is shown that the usual expansion solutions of the Boltzmann equation (Chapman-Enskog-Burnett, and Grad) are not valid for this problem. Solutions, instead, are obtained by means of an expansion of the distribution function in a set of velocity polynomials which have been orthogonalized with respect to a zero-order distribution function characteristic of a collisionless gas, rather than a Maxwell distribution function as is usually done. These solutions are used to derive absorption and dispersion functions characterizing the sound propagation. These are shown to be in agreement with experimental data for the problem. (Author)

AD-621 664 See Fld. 6/16

AD-621 906 See Fld. 12/1

AD-621 907 See Fld. 12/1

AD-621 982 See Fld. 8/10

20/2. CRYSTALLOGRAPHY

AD-621 656 Div. 25/2 ,4/4 ,4/2
JOHNS HOPKINS UNIV BALTIMORE MD
POLYMORPHISM IN HYDROGEN IODIDE,
by F. A. Mauer, C. J. Keffer, R. B. Reeves, and D. W. Robinson. 26 Oct 64, 4p. Contract AF49 638 1430 Proj. 9710 Task 971003
AFOSR , 65-1243
Unclassified report

Pub. in Journal of Chemical Physics v42 n4 p1465-6 Feb 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hydrogen compounds, Iodides), (*Iodides, Crystal structure), (*Crystal structure, Iodides), X rays, Temperature, Crystal growth, Crystal lattices

The crystal structure of hydrogen iodide was investigated over the temperature range 4.2 -180K, using CuK alpha radiation, lambda = 1.54051 A. Values of the Bragg angle were plotted as a function of temperature in an effort to detect any anomaly in the thermal expansion. The results showed that the pattern obtained at temperatures up to at least 120K could be indexed on the basis of a face-centered tetragonal cell; a face-centered cubic arrangement existed from 130-180K, but at 180K there was some splitting of lines presumably resulting from apottiness of the powder pattern caused by grain growth. (Author)

AD-621 708 Div. 25/2 ,14/2
CFSTI Prices: HC $2.00 MF $0.50
LITTON PRECISION PRODUCTS INC MORRIS PLAINS N J AIRTRON DIV
HYDROTHERMAL GROWTH OF CRYSTALS OF LAALO3.
Semiannual technical summary rept. for 31 Dec 64-1 Jul 65.
1 Jul 65, 42p. Contract Nonr461600 Proj. arpa order 306 62
Unclassified report

Descriptors: (*Lanthanum compounds, Aluminates), (*Crystal growth, Lanthanum compounds), Solubility, Impurities, Chronium, Phase studies, Dielectrics, Ceramic materials

Large crystals of LaAlO3 were successfully grown from a straight PbF2 flux. However, soak temperatures above 1400C are required for solution of LaF3 formed by the reaction of La2O3 and PbF2. These high temperatures result in premature failure of the furnace and platinum container. PbF2 was, therefore, abondoned and a search was initiated to modify the PbF2 flux, or to find a more suitable solvent. Among the solvents investigated were PbO-PbF2, BaO and Bi2O3, all with small additions of B2O3. Results are encouraging. The regions of phase stability were determined for LaAlO3 and La (OH)3 under hydrothermal conditions. From this data it is apparent that in order to operate in a region where LaAlO3 is the only stable solid and to stay below the 435C transition temperature, the solvent concentrations must be <2 or <7 m K2CO3. The composition of the fluid was analyzed quantitatively for alumina and lanthana content. Although the data show considerable scatter, they are in agreement with and have confirmed the observed crystallization of solid La (OH)3. In the large crystal growth autoclaves, spontaneous nucleation of LaAlO3 in the growth chamber has been obtained from a nutrient composed of powdered La2O3 and flame fusion ruby pieces. (Author)

AD-621 739 Div. 25/2 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
LOWELL TECHNOLOGICAL INST RESEARCH FOUNDATION MASS
EFFECTS OF EXTERNAL FORCES (TRANSIENT AND PERMANENT).
Quarterly rept. no. 1, 1 May-31 Jul 65,
by Charles R. Mingins, Robert W. Perry, and Luther C. Barcus. 31 Jul 65, 66p. Rept. no. 17
Contract DA28 043AMC01240E Proj. DA1P6 22001A058 Task DA1P6 22001A058 01 04
Unclassified report

See also AD-619 715.

Descriptors: (*Quartz, Stresses), (*Piezoelectric crystals, Vibration), Stability, Frequency, Force (Mechanics), Acceleration, Compressive properties, Tensile properties, Torque, Crystal oscillators

Investigations were made of the reactions of a vibrating piezoelectric crystal plate to the application of external forces and torques, including the possibility of transient effects. Experiments are reported dealing with the effects of the superposition of forces and of combinations of forces. The results of applying considerably larger tensile forces than any previously used are discussed. Further work on the effects of torsional stresses about various axes is reported. Arrangements for setting up shearing stresses are being developed. A report of further advances in the theory in terms of nonlinear behavior is included. (Author)

AD-621 756 Div. 25/2 ,25/4
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PHYSICS
GAS-SURFACE INTERACTIONS AND FIELD ION MICROSCOPY OF NONREFRACTORY METALS.
Technical rept.,
by Erwin Muller, S. Nakamura, O. Nishikawa, and S. B. McLane. 23 Dec 64, 9p. Rept. no. TR-5
Contract Nonr65623 Proj. NR017 443
Unclassified report

Pub. in Journal of Applied Physics v36 n8 p2496-2503 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Transition elements, Surface properties), (*Microscopy, Transition elements), Crystal lattices, Evaporation, Stresses,Thermal properties, Ionization, Polarization, Iron, Nickel, Tungsten, Steel, Niobium

The performance of the helium field-ion microscope depends critically upon accommodating He atoms of 0.15-eV kinetic energy to the specimen tip. The small accommodation coefficient requires the field-trapped He atom to make several hundred contacts with the cold tip surface. The hoping He atoms diffuse preferentially to tip regions where the high local field permits ionization before full accommodation is reached. Improved accommodation is achieved with the provision of an intermediate collision artner in the form of adsorbed neon or, preferably, hydrogen or deuterium. Now a high-resolution He ion image is obtained at 70% of the field used before. As the addition of hydrogen promotes field evaporation, its partialpressure must be carefully controlled to achieve image stability of the nonrefractory metals. Low-field evaporation by the hydrogen reaction permits easy conditioning of the tip surface of the nonrefractory transition metals so that artifacts caused by yielding to He evaporation field stress are no longer a problem. The field evaporation end form obtained with hydrogen added to He more closely approaches the desirable spherical shape of the emitter than does field evaporation in vacuum or in a single imaging gas. As examples, ion images of niobium, nickel, iron, and high carbon steel are shown. (Author)

AD-621 757 Div. 25/2 ,25/4
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PHYSICS
FIELD-EVAPORATION END FORM OF TANTALUM.
Technical rept.,
by Shogo Nakamura, and Erwin W. Muller. 8 Mar 65, 6p. Rept. no. TR-6
Contract Nonr65623 Proj. NR017 443
Unclassified report

Pub. in Journal of Applied Physics v36 n8 p2535-9 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Crystal lattices, Surface properties), (*Evaporation, Metallic crystals),

(*Tantalum, Crystal lattices), Polarization, Stresses, Microscopy, Field emission

A field-evaporation end form depends in a complicated way upon many factors. The end form of a pure and nearly perfect metal crystal as obtained under various conditions must be established experimentally to permit proper interpretation of field-ion micrographs of general specimens of that metal. The end form of tantalum, distinctly different from other bcc metals such as tungsten, molybdenum, and iron, is shown in its dependence on temperature, hydrogen promotion, and field-stress-induced slip. Low-coordination atom sites stabilized by polarization occur in specific crystallographic regions. (Author)

AD-621 937 Div. 25/2
CFSTI Prices: HC $2.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C
SCATTERING OF POLARIZED LIGHT BY NEMATICTYPE LIQUID CRYSTALS,
by Pierre Chatelain. Oct 65, 26p. Contract DA44 009AMC930T Proj. 1P014501A31B AERDL ,TT T-1803-65, ,65-64085
Unclassified report

Trans. of Acta Crystallographica (Denmark) v1 p315-23 1948.

Descriptors: (*Crystals, Liquids), (*Light, Scattering), (*Liquids, Crystals), Crystal structure, Optical properties, Organic nitrogen compounds, Ethers, Polarization, France

Experiments were made on the scattering of plane polarized sodium light by an oriented preparation of azoxyanisole in the liquid-crystal state at scattering angles, S from 0 - 50 deg. It was found that the most intense scattered radiation is polarized at right angles to the vibration direction of the incident beam. The variation of the scattered intensity, I, as a function of s is given by $I = k/(\sin s)$ to the mth power, (m = 1, ..., 6) and shows that scattering is due to large particles; a comparison of scattering in forward and backward directions indicates that the dimensions of these particles are of the order of 0.2 microns. The principle of reciprocity is found to apply to the liquid-crystal preparation, as was expected for a medium possessing an axis of revolution. (Author)

AD-621 938 Div. 25/2
CFSTI Prices: HC $1.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C
THEORETICAL STUDY OF THE SCATTERING OF LIGHT BY A FLUID DISPLAYING A SINGLE AXIS OF ISOTROPY: APPLICATION TO NEMATIC-TYPE LIQUID CRYSTALS,
by Pierre Chatelain. Oct 65, 16p. Contract DA44 009AMC930T Proj. 1P014501A31B AERDL ,TT T-1804-65; ,65-64086
Unclassified report

Trans. of Acta Crystallographica (Denmark) v4 p543-7 1951.

Descriptors: (*Crystals, Liquids), (*Light, Scattering), (*Liquids, Crystals), Crystal structure, Isotropism, Diffusion, Optical properties, Polarization, Organic nitrogen compounds, Ethers, France

A theoretical study is made of the diffusion of light by a liquid composed of anisotropic particles which show fluctuations in orientation and are so distributed that the medium possesses a unique isotropic axis. Two cases are considered: (1) discrete anisotropic molecules; (2) large groups of parallel anisotropic molecules dispersed among isolated molecules. In the two cases the theory leads to depolarization factors greatly in excess of unity. Spherical groups, of radius 0.1 microns, containing 1,000,000 molecules of azoxy-anisole arranged parallel and inclined at an angle < 36 deg to the isotropic axis and single molecules inclined at an angle > 36 deg are discussed in detail, and the results obtained agree in order to magnitude with experiment. It can, therefore, be concluded that in nematic liquid crystals diffusion is due to fluctuations in the orientation of the molecules round the isotropic axis and that the fluctuations in two molecules can be treated as independent only if their separation exceeds 0.1 microns. (Author)

AD-622 287 Div. 25/2 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
FABRICATION AND EVALUATION OF SILICON EPITAXIAL FILMS MADE BY THE PYROLYTIC DECOMPOSITION OF SILICON TETRACHLORIDE.
Technical memo.,
by M. F. Goodman. Sep 65, 39p. Rept. no. TG-731
Contract NOw62 0604
Unclassified report

Descriptors: (*Silicon, Epitaxial growth), (*Films, Epitaxial growth), (*Silicon compounds, Chlorides), Pyrolysis, Decomposition, Crystal lattice defects, Hydrogen, Etched crystals, Gas flow, Semiconductors

EPITAXIAL FILM FABRICATION: The following items are discussed: gas bubbler for the saturator that insures saturation of the hydrogen carrier gas with SiCl4, reaction chamber that can withstand the 1000 to 1300C deposition temperature and will not appreciably dope the substrate material, a susceptor material that allows efficient RF coupling and negligible background doping, requirements for the carrier gas, and flow meters and valves that can handle the gases used. GROWING DOPED SILICON EPITAXIAL FILMS BY PYROLYTIC DECOMPOSITION: Preparation of the Si substrate includes chemical etching by hydrogen chloride gas. Step-by-step directions are given for preparation of the system. IMPORTANT FILM GROWTH PARAMETERS: Growth rate of the film is held constant with time by having fixed temperatures for the furnace and evaporator and fixed gas flow rates. TECHNIQUES USED IN FILM EVALUATION.

AD-621 895 See Fld. 20/6

AD-621 896 See Fld. 9/1

AD-621 936 See Fld. 9/1

AD-621 994 See Fld. 20/12

AD-622 068 See Fld. 20/12

AD-622 090 See Fld. 20/12

AD-622 278 See Fld. 21/9

20/3. ELECTRICITY AND MAGNETISM

AD-621 654 Div. 25/3
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
SESSION P-5: INTENSE MAGNETIC FIELDS. P-5.2: MAGNETS FOR FIELDS ABOVE 100 KILOGAUSS,
by D. Bruce Montgomery. 1964, 4p. Contract AF19 604 7344 Proj. 9764
AFOSR , 65-1173
Unclassified report

Pub. in NEREM Record, 1964 (Copies not available to DDC or Clearinghouse customers). Digest of papers prepared for presentation at Northeast Electronics Research and Engineering meeting Nov 4-6 1964.

Descriptors: (*Magnets, Copper), Coils, Water, Cooling, Magnetic fields, Electric discharges, Pulse generators

Methods of generating high magnetic fields beyond those obtainable with laboratory-type iron magnets are discussed. The only practical methods other than high-field superconductors, use copper magnets, water-cooled for continuous duty, and uncooled or pre-cooled for pulse duty. For water-cooled magnets, the cooling process and the strong forces of the high water velocities constitute the principal design problems. (Author)

AD-621 662 Div. 25/3
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
HIGH-FREQUENCY CONDUCTIVITY OF A PLASMA,
by T. L. Thourson, and M. B. Lewis. 18 Dec 64, 8p.
Unclassified report

Pub. in The Physics of Fluids v8 n6 p1119-26 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Plasma medium, Conductivity), Partial differential equations, Integral transforms, Statistical functions, Electrons, High frequency

The high-frequency conductivity of a fully ionized plasma is calculated from the Bogoliubov-Born-Green-KirkwoodYvon equations for a plasma subjected to an applied field. These equations are used in the plasma limit but with the further approximation that those terms which lead to a screened Coulomb potential are replaced by a Coulomb potential with a range of the Debye length. This leads to a generalized Fokker-Planck equation, i.e., the collisional term has a more general space and time dependence than the usual Fokker-Planck equation. The equation in linearized about equilibrium and is solved by assuming that the effect of the field dominates the effect of the collisions. The effects of electron-electron as well as electron-ion collisions are considered and the results are calculated to second order in the wavenumber. (Author)

AD-621 689 Div. 25/3 ,9/5 ,30/3
CFSTI Prices: HC $7.00 MF $1.75
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB
STUDIES ON ELECTROMAGNETIC MEANS OF ADDING HEAT AND KINETIC ENERGY TO A GAS.
Final rept. for Dec 61-Dec 64,
by Laurence R. Boedeker, James B. Coffin,Jr., Eugene E. Covert, and Charles W. Haldeman.
Jun 65, 374p. Contract AF33 657 7975 Proj. 7065
ARL , 65-121
Unclassified report

Descriptors: (*Plasma medium, Electromagnetic waves), (*Electromagnetic waves, Gas flow), (*Atmosphere entry, Simulation), (*Acceleration, Plasma medium), Heating, Gases, Aerodynamic heating, Plasma sheath, Perturbation theory, Traveling-wave electron accelerators, Magnetohydrodynamics, Ionization chambers

The work completed during the three year contract period on electromagnetic means of adding heat and kinetic energy to a flowing gas stream is presented. Included are discussions of: the nonequilibrium RF plasma source; the magnetic induction accelerator including the effects of using magnetic core material in the accelerator coils; methods of coil design; numerical results for the one-dimensional flow in the traveling wave pump for various

modes of operation; the unsteady axisymmetric flow near the inlet and the resulting velocity profiles; and methods of instrumentation employed to measure plasma properties. A brief discussion of the primary difficulties encountered is also presented. (Author)

AD-621 771 Div. 25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ON THE KINETIC THEORY OF THE BOUNDARY LAYER BETWEEN A RAREFIED PLASMA AND A MAGNETIC FIELD,
by Yu. S. Sigov. 30 Aug 65, 20p. Rept. no. FTD-MT-65-152
TT , 65-64037

Unclassified report

Edited machine trans. of Zhurnl Vyvhislitelnoi Matematiki i Matematicheskoi Fiziki (USSR) v4 n6 p1065-77 1964.

Descriptors: (*Magnetohydrodynamics, Boundary layer), (*Boundary layer, Kinetic theory), (*Plasma medium, Magnetic fields), Differential equations, Potential theory, Plasma physics, USSR

The work refines the mathematical formulation of the general steady-state problem about the structure of a selfconsistent electromagnetic field in the plane 'plasma magnetic field' transition layer, and presents a qualitative analysis of solutions. Under the assumption of absence of 'captured' particles, the law of decrease of the self-consisten field is found. It is shown that in this case, for a broad class of distribution functions of particles between homogeneous plasma and electromagnetic field, there is realized a sharp boundary. An attempt is made to formulate clearly all physical assumptions and mathematical restrictions, while perserving that order in which they appear in a natural manner in theory.

AD-621 913 Div. 25/3
CFSTI Prices: HC $3.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
THE DEPENDENCE OF LONGITUDINAL PLASMA WAVE DAMPING AND GROWTH ON THE SHAPE OF THE VELOCITY DISTRIBUTION FUNCTION.
Scientific rept.,
by Daniel P. Mioduszewski. 15 Nov 65, 76p.
Rept. no. SR-225
Contract AF19 628 4014 Grant ,NSF GP2914
Proj. 8605 Task 860502
AFCRL , 65-638

Unclassified report

Descriptors: (*Plasma oscillations, Statistical functions), Electromagnetic waves, Propagation, Perturbation theory, Integral transforms, Plasma physics

This paper uses the transform and perturbation theory approach for the problem of longitudinal plasma oscillations. The plasma dispersion relation is shown to be a natural consequence of both the initial value problem and the problem of forced oscillations. Distribution functions of the form F sub O (v) = A sub n 1/ (V-U) to the 2n power + sigma to the 2n power where n = integer are investigated for both the single and double hump case. For the forced oscillations problem wave growth is obtained in space when the driving frequency is less than the plasma frequency. Wave growth is also described for the double hump distribution. (Author)

AD-621 943 Div. 25/3 ,2/1
CFSTI Prices: HC $3.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
NONLINEAR TERMS IN THE GENERALIZING OHM'S LAW: A SCALE ANALYSIS.
Physical sciences research papers,
by Noel Stone. Aug 65, 53p. Rept. no. AFCRL-65-571 ,PSRP-126
Proj. 8605 Task 860509

Unclassified report

Descriptors: (*Magnetohydrodynamics, Electrical properties), (*Resistance (Electrical), Voltage), Electric currents, Plasma jets, Hall effect, Gas flow, Momentum, Geometry, Solar corona, Space charges, Solar wind

It is shown that a spatial gradient in the steady flow of an ionized gas introduces terms into the generalized Ohm's law that represent an exchange of momentum between the electrons and the gas flow. Depending upon the flow geometry and gas compressibility this electrokinetic exchange can behave like a generator, a Hall current, or a resistive current. The scale of the phenomenon is L = +/V, where V is fluid velocity, + is electron-positive charge collision time. Electrokinetic conditions apply largely at boundaries. In a resistive medium with a static B-field, the principal condition for electron-flow interchange is that magnetic pressure dominate dynamic pressure. At the boundary of a plasma jet the scale over which EK terms are importan' is of the order of 1 mm. Only geometry and scale considerations are used in the momentum equation. The electrokinetic generation of surface currents is as fundamental for describing moving media as spacecharge effects are in the static case. (Author)

AD-621 990 Div. 25/3
CFSTI Prices: HC $4.00 MF $1.00
COLUMBIA UNIV NEW YORK PLASMA LAB
IONIZING SHOCK STUDIES IN AN ELECTROMAGNETICALLY DRIVEN SHOCK TUBE,
by Bennett Miller. Jun 65, 140p. Rept. no. 19
Contract AF49 638 1254

Unclassified report

Descriptors: (*Shock waves, Ionization), (*Magnetohydrodynamics, Shock waves), Shock tubes, Electrical conductance, Theory, Magnetic fields, Instrumentation

A coaxial electromagnetic shock tube was used to study ionizing shocks propagating through hydrogen. An experiment is described which produced plane switch-on ionizing shocks. Studies were conducted covering the sub-Alfvenic, trans-Alfvenic and super-Alfvenic regimes. Data is presented that verifies the existence of switch-on fronts in all these regimes, and demonstrates the significant effect of the initial electric field on the shock jump conditions. The results substantiate the theory of normal ionizing shocks developed by Taussig. A simple physical criterion is employed to choose from among the several theoretically predicted ionizing waves propagating at a given speed. This criterion has strong intuitive support and results in a consistent picture of ionizing shock propagation that is in general agreement with out experimental observations. The existence of a small homogeneous plasma sample, behind the ionizing shock wave and before the expansion fan, is demonstrated. Previous failures to find large homogeneous plasma samples are shown to be consistent with the theory of ionizing shock waves. (Author)

AD-621 992 Div. 25/3
CFSTI Prices: HC $3.00 MF $0.75
QUEEN'S UNIV BELFAST (NORTHERN IRELAND)
NOTES ON PLASMA OSCILLATIONS.
Scientific rept.,
by K. G. Emeleus, and J. M. Jones. Jul 65, 58p.
Rept. no. SR-2
Contract AF EOAR62 68 Proj. 7073 Task 707303
ARL , 65-151

Unclassified report

See also AD-437 317.

Descriptors: (*Plasma oscillations, Electric discharges), Electron beams, Ion beams, Plasma sheath, Cathodes, Broadband, Electromagnetic waves, Discharge tubes, Great Britain

Experiments are reported on the propagation and growth of spontaneously generated broad band surface waves in a hot-cathode low pressure discharge. (Author)

AD-622 036 Div. 25/3
CFSTI Prices: HC $4.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
VARIABLE CONDUCTIVITY FULLY DEVELOPED MHD CHANNEL FLOW.
Master's thesis,
by Paul Clement Kieffer. Jun 65, 101p. Rept. no. GAM-65B/ME/65-4

Unclassified report

Descriptors: (*Magnetohydrodynamics, Electrical conductance), Gas flow, Electrical properties, Measurement, Errors, Velocity, Two-dimensional flow

Fully developed MHD channel flow was studied for several conductivity profiles to determine the effect of non-uniform conductivity on the flow variables. The velocity profiles, volume rate of flow, and shear at the wall were investigated. If the conductivity only varies near the wall, the flow is moderately affected. If the conductivity in the central portion of the channel varies, significant changes (as much as 300% error based on uniform conductivity results) can occur. Variable conductivity has its greatest effect when the conductivity increases from the centerline to the walls. Inflection points can occur in the velocity profiles when the conductivity decreases from the centerline to the walls. (Author)

AD-622 088 Div. 25/3 ,30/5
CFSTI Prices: HC $3.00 MF $0.75
TEXAS UNIV AUSTIN
KERR CELL PHOTOGRAPHY OF A DYNAMICAL DEUTERIUM PLASMA PRODUCED IN A 30 KILOJOULE THETA PINCH.
Interim technical rept.,
by H. N. Roberts, R. F. Gribble, and A. A. Dougal. Aug 65, 71p. Contract AF33 657 11073
Proj. 7073 Task 707301
ARL , 65-171

Unclassified report

Descriptors: (*Plasma medium, Photographic analysis), (*Magnetic pinch, Photographic analysis), Plasma sheath, Luminescence, Deuterium, Kerr cells, Light, Intensity

A 0.1 microsec Kerr cell shutter was employed in a photographic investigation of the space and time history of the luminous ring characteristic of the plasma current sheath in a high temperature, pure, dense, deuterium plasma formed in the 'theta pinch' geometry. A method is proposed for obtaining rough estimations of relative electron densities from photographically recorded light intensities. The effect that different bias field intensities have on the beginning of the initial inward sweep of the luminosity is correlated with simple theory providing an indication that the current sheath and luminous ring are coincident during the initial inward sweep. Snowplow model energy calculations performed with the slope of the initial inward sweep from position versus time plots indicate ion energies from 40 to 100 ev agreeing within 10 per cent to computer calculations based on the theoretical considerations employed by the Hain-Roberts code. The noted dependence of the initial minimum radial position on reverse bias field intensity is interpreted to support the theory that the reverse bias field is 'trapped' by the current sheath. The leading edge of the observed luminosity is essentially the position of maximum particle density during the initial inward sweep.

AD-622 093 Div. 25/3
INNSBRUCK UNIV (AUSTRIA) INST FOR THEORETICAL PHYSICS
NUMERICAL METHODS IN GASDYNAMICS AND MGD.
Scientific rept.,
by F. Herrnegger. 21 Dec 64, 18p. Rept. no. SR-18
Contract AF61 052 675
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Magnetohydrodynamics, Numerical analysis), One-dimensional flow, Two-dimensional flow, Errors, Difference equations, Partial differential equations, Austria

AD-622 123 Div. 25/3 ,25/6
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
SHEAR AND LONGITUDINAL MAGNETOELASTIC WAVES IN TRANSVERSELY MAGNETIZED RODS,
by R. L. Comstock, and P. E. Wigen. 23 Oct 64, 3p.
Unclassified report

Pub. in Journal of Applied Physics v36 n8 p2426-8 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mechanical waves, Propagation), (*Rods, Magnetic fields), Garnet, Ferromagnetic materials, Energy conversion

An analysis is presented of the propagation of magnetoelastic waves in transversely magnetized rods. Efficiencies for longitudinal wave-spin wave and shear wave-spin wave conversion are evaluated for the case of a (110) rod magnetized along (111). Alongitudinal to shear wave converter in yttrium iron garnet is discussed which is estimated to have 20-dB conversion efficiency at 3 Gc/sec. (Author)

AD-622 124 Div. 25/3
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
VALIDITY OF TOWNSEND'S IONIZATION FUNCTION IN NONUNIFORM ELECTRIC FIELDS,
by D. E. Golden, and L. H. Fisher. 5 Apr 65, 4p.
Unclassified report

Pub. in The Physical Review v139 n5A pA1452-5 Aug 30 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electric fields, Gas ionization), (*Ionization potential, Electric fields), Electric currents, Potential theory, Electric discharges, Plasma physics

A number of authors have concluded that experimental values of prebreakdown ionization-gas-current multiplications in nonuniform electric fields are not correctly predicted by generalizing Townsend's ionization function for uniform fields to nonuniform fields. It is shown that the reported failures are mainly due to the use of incorrect values of the first Townsend ionization coefficient. (Author)

AD-622 222 Div. 25/3 ,8/6 ,2/6
CFSTI Prices: HC $1.00 MF $0.50
KIRUNA GEOPHYSICAL OBSERVATORY (SWEDEN)
ON THE INFLUENCE OF GRAVITY ON MAGNETOHYDRODYNAMIC WAVE PROPAGATION.
Scientific rept.,
by W. Riedler. Jun 65, 23p. Rept. no. SR-4
Contract AF61 052 619
AFCRL , 65-688
Unclassified report

Descriptors: (*Magnetohydrodynamics, Gravity), (*Gravity, Magnetohydrodynamics), Plasma oscillations, Electromagnetic waves, Propagation, Magnetic fields, Terrestrial magnetism, Geophysics

The influence of a uniform gravity field on magnetohydrodynamic wave propagation in an ideal medium with uniform magnetic field is discussed for two cases: (1) gravity force parallel to the magnetic field and (2) gravity force perpendicular to the magnetic field.

AD-622 223 Div. 25/3 ,2/6 ,2/7
CFSTI Prices: HC $4.00 MF $1.00
KIRUNA GEOPHYSICAL OBSERVATORY (SWEDEN)
PLASMA WAVES IN THE FREQUENCY RANGE 0.00110 CPS IN THE EARTH'S MAGNETOSPHERE AND IONOSPHERE: A SURVEY.
Final rept.,
by Bengt Hultqvist. Jun 65, 138p. Contract AF61 052 619
AFCRL , 65-683
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Upper atmosphere, Magnetohydrodynamics), (*Magnetohydrodynamics, Upper atmosphere), (*Ionosphere, Magnetohydrodynamics), Extremely low frequency, Plasma oscillations, Mathematical models, Geophysics, Plasma physics, Terrestrial magentism

The plasma model for the magnetospher and ionosphere is first discussed. A review of some parts of the theory for a warm collisionless plasma of interest in the magnetosphere in connection with waves of periods between 0.1 and 1000 seconds is given. The theory for magnetohydrodynamic waves in a slightly ionized gas is then summarized. The available observational data about magnetospheric and ionospheric phenomena, which may be interpreted in terms of waves with periods between 0.1 and 1000 seconds, are briefly survayed and some theoretical applications to the ionosphere and magnetosphere are finally discussed. Most of the report is devoted to warm-plasma theory. The theory of shock phenomena and transients in the magnetosphere is not included in the report. (Author)

AD-622 232 Div. 25/3 ,20/2
CFSTI Prices: HC $4.00 MF $1.00
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
CHARGE-CHANGING COLLISIONS IN GASES. A DESCRIPTIVE BIBLIOGRAPHY. I.
6 Feb 64, 146p. Rept. no. AID-U-64-4
TT , 65-64121
Unclassified report

Compiled from Zhurnal Eksperimentalnoi i Teoreticheskoi Fizika (USSR) 1930-63. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ionization, Gases), (*Nuclear scattering, Ionization), Bibliographies, Plasma medium, Electron capture, Perturbation theory, Electric discharges, Dissociation, Excitation, Inelastic scattering, Hydrogen, Oxygen, Water, Helium group gases, Ions, Iron, Cobalt, Nickel, Silicon, Germanium, Tin, Lead, Lithium, USSR

A bibliography is given of charge-changing collisions in gases. Eighty-seven articles are listed and their abstracts are included.

AD-622 240 Div. 25/3 ,20/2
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
CHARGE-EXCHANGE COLLISIONS IN GASES. ANNOTATED BIBLIOGRAPHY, PART II.
AID Work Assignment no. 43, Task 13.
6 May 64, 60p. Rept. no. AID-U-64-34
Unclassified report

Compiled from Zhurnal Tekhnicheskoi Fiziki (USSR) 1950-63. Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Ionization, Gases), (*Nuclear scattering, Ionization), Bibliographies, Plasma medium, Ions, Ion beams, Helium group gases, Stripped atom, Nitrogen, Hydrogen, Electric discharges, Electron capture, Oxygen, Chlorine, Aerosols, USSR

A bibliography is given of charge-exchange collisions in gases. Thirty-five articles are listed and their abstracts are included.

AD-622 271 Div. 25/3 ,8/6
CFSTI Prices: HC $3.00 MF $0.75
MICROWAVE LAB STANFORD UNIV CALIF
RESEARCH ON PLASMA BOUNDARY STUDIES.
Final rept. for 1 Mar 61-28 Feb 65,
by G. Kino, S. Self, and J. Pavcovitch. Jul 65, 68p. Rept. no. ML-1331
Contract AF33 616 8121 Proj. 7073 Task 707301
ARL , 65-131
Unclassified report

See also AD-609 567.

Descriptors: (*Plasma sheath, Radio transmission), (*Radio transmission, Plasma sheath), Gas ionization, Boundary layer, Electromagnetic waves, Propagation, Electric fields, Radio fields, Radiofrequency power, Electron beams, Probes (Electromagnetic), Boundary value problems, Plasma physics

The main purpose of this study was to obtain a thorough understanding of the static and rf properties of the sheath of a low pressure discharge plasma, and to arrive at simplified boundary conditions for rf fields which take account of the presence of the sheath at the edge of the plasma. Theoretical and experimental studies of both the rf and dc properties of the sheath have been undertaken and good agreement obtained between theory and experiment.

AD-622 277 Div. 25/3
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
THE INFLUENCE OF MAGNETIC HYSTERESIS ON SKIN EFFECT,
by John C. Corbin,Jr.. Aug 65, 32p. Rept. no. ARL-65-167
Proj. 7073
Unclassified report

Descriptors: (*Hysteresis, Electrical conductance), (*Electrical conductance, Hysteresis), Iron, Conductivity, Resistance (Electrical), Field theory, Numerical analysis, Nonlinear differential equations

This report derives the skin effect equations for currentcarrying cylindrical conductors and semi-infinite sheets taking into account weak magnetic hysteresis effects. Numerical solutions to the nonlinear equations are obtained for annealed iron conductors as a function of frequency and magnetic field intensity; results are compared with analytical solutions obtained if hysteresis effects are neglected. With hysteresis present the ratio of

a-c reactance to d-c resistance decreases significantly whereas the ratio of a-c resistance to d-c resistance shows little change. (Author)

AD-621 703 See Fld. 20/13

AD-621 705 See Fld. 20/12

AD-621 745 See Fld. 17/9

AD-621 751 See Fld. 9/5

AD-621 783 See Fld. 20/13

AD-621 795 See Fld. 12/1

AD-621 833 See Fld. 21

AD-621 860 See Fld. 20

AD-622 070 See Fld. 12/1

AD-622 072 See Fld. 20/14

AD-622 209 See Fld. 20/12

AD-622 261 See Fld. 20/8

AD-622 270 See Fld. 9/5

20/4. FLUID MECHANICS

AD-621 657 Div. 9/1 ,15/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ALTERNATIVE TECHNIQUES FOR THE INVARIANT IMBEDDING OF RAREFIED COUETTE FLOWS,
by J. Aroesty, R. Bellman, R. Kalaba, and S. Ueno. Aug 65, 22p. Rept. no. RM-3773-ARPA Contract SD79 Proj. arpa order 189-61

Unclassified report

Descriptors: (*Couette flow, Invariance), (*Transport properties, Couette flow), Gas flow, Perturbation theory, Operators (Mathematics), Integral equations, Nonlinear differential equations, Boundary value problems

The Memorandum re-examines the application of invariance techniques to plane Couette-flow problems and presents several different approaches to the derivation of the invariant-imbedding equations. It is shown how both linear and nonlinear collision operators may be considered, for both discrete and continuous versions of the original Boltzmann formulation. (Author)

AD-621 669 Div. 9/7
FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA
NEAR WAKE OF A BLUNT BODY AT HYPERSONIC SPEEDS,
Revised ed.,
by C. Forbes Dewey,Jr.. 17 Nov 64, 10p. Contract DA31 124ARO D33

Unclassified report

Pub. in AIAA Journal v3 n6 p1001-10 Jun 1965 Revision of manuscript submitted 20-22 Jan 64 (Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Blunt bodies, Wake), (*Wake, Hypersonic flow), Aerodynamic loading, Shear stresses, Base flow, Laminar flow, Two-dimensional flow, Stagnation point, Cylindrical bodies

An experimental investigation was conducted to determine the characteristics of the near wake of a blunt body in hypersonic flow. Base-pressure and body-surface pressure measurements are combined with hot-wire and pitot-pressure data to describe the free shear layer, the base-flow region, the recompression zone, and the initial development of a laminar wake. It is found that the postulate of thin shear layers is valid for Reynolds numbers greater than about 10000, if the Mach number external to the shear layer is not large. Detailed measurements with a steady-state hot-wire behind a two-dimensional circular cylinder indicate that the maximum pressure rise occurs downstream of the stagnation point formed by the merging shear layers. The hot-wire measurements are corroborated by base-pressure data obtained with cylinders and wedges. Comparison between the experimental and theoretical results points out the importance of the base-flow temperature and the initial shear-layer profile in determining the observable characteristics of the near wake. (Author)

AD-621 740 Div. 9/4 ,30/5
CFSTI Prices: HC $2.00 MF $0.50
IOWA UNIV IOWA CITY INST OF HYDRAULIC RESEARCH
EXPERIMENTAL STUDY OF METHODS OF DETERMINING WAVE-MAKING RESISTANCE BY MEANS OF SURFACE-PROFILE MEASUREMENTS.
Progress rept.,
by Helmut E. Kobus. Mar 65, 38p. Contract Nonr161105

Unclassified report

Descriptors: (*Water waves, Ship models), (*Wake, Ship models), (*Vortices, Ship models), Floating bodies, Drag, Towed bodies, Viscosity, Least squares method

Surface profiles behind a ship model are measured and the wavemaking resistance is evaluated according to the theory available at this time. The theory is corrected and refined in order to make it more compatible with actual flow conditions. The presence and importance of bilge vortices are investigated.

AD-621 741 Div. 9/4
CFSTI Prices: HC $2.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES INST OF GEOPHYSICS AND PLANETARY PHYSICS
HORIZONTAL OSCILLATIONS OF FALLING SPHERES.
Final rept.,
by Uri Shafrir. 1 Feb 65, 46p. Contract AF19 628 3993 Proj. 6682 Task 668208 AFCRL , 65-141

Unclassified report

Descriptors: (*Falling bodies, Oscillation), (*Oscillation, Falling bodies), Hydrodynamics, Spheres, Viscosity, Water, Drag, Vortices, Trajectories, Reynolds number, Stereoscopic photography

Experiments with solid spheres with diameters of 3/16 in. to 14/16 in. and specific gravities in the range of 1.14 to 14.95 gm/cc, falling in distilled water at 20 - 24 C were carried out. With the aid of a stereophotographic-strobe technique, the time resolved, three dimensional trajectory of each sphere was recorded. Analysis of the trajectories revealed the existance of horizontal oscillations of a falling sphere, with amplitude and wave length depending to some extent on the Reynolds number. (Author)

AD-621 760 Div. 9/4 ,9/1
IOWA UNIV IOWA CITY INST OF HYDRAULIC RESEARCH
FLOW IN THE WAKE OF SELF-PROPELLED BODIES AND RELATED SOURCES OF TURBULENCE,
by Eduard Naudascher. 27 Jan 65, 36p. Contract Nonr161103

Unclassified report

Pub. in J. Fluid Mech. v22 pt 4 p625-56 1965 (Copies available only to DDC users).

Descriptors: (*Wake, Turbulence), (*Hydrodynamic configurations, Wake), Underwater propulsion, Axially symmetric flow, Simulation, Wind tunnels, Mathematical analysis

In the steady-state counterpart of the wake behind a totally immersed, self-propelled body, simulated in an air tunnel by a concentric nozzle and disk, measurements were made of mean-flow velocity and pressure, turbulence intensities in the three co-ordinate directions, turbulent shear, and mean temporal gradient and auto-correlation of the axial-velocity flucutations. Through the equations of momentum and energy for the mean and the turbulent motion, the experimental data were used to verify the condition of self-propulsion and the accuracy of measurement, and to provide a picture of the force field and the process of energy transformation. The variation of the principal flow characteristics was analysed with the aid of appropriate hypotheses as to the transport mechanism and the structure of the turbulence. (Author)

AD-621 770 Div. 9/2 ,10/7
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
FLOWS OF GAS WITH IGNITION BEHIND A SHOCK WAVE,
by R. I. Soloukhin. 30 Aug 65, 19p. Rept. no. FTD-MT-64-523
TT , 65-64036

Unclassified report

Edited machine trans. of mono. Problemy Energetiki, Moxcow, 1959 p735-44.

Descriptors: (*Shock waves, Gas flow), (*Detonation waves, Shock tubes), Mathematical analysis, Ignition, Combustion, Detonations, Stability, Oscillation, USSR

Consideration is given to the state of a gas behind a shock wave propagating in a gas mixture capable of chemical reaction. A description is given of the phenomenon of spinning detonation as a result of instability of the supercompressed detonational wave, which leads to the onset of oscillations.

AD-621 850 Div. 9/7
GRADUATE AERONAUTICAL LABS CALIF INST OF TECH PASADENA
SOME OBSERVATIONS ON TRANSITION AND REATTACHMENT OF A FREE SHEAR LAYER IN INCOMPRESSIBLE FLOW,
by Anatol Roshko, and Jark C. Lau. 1965, 11p.

Unclassified report

Pub. in Proceedings of the 1965 Heat Transfer and Fluid Mechanics Institute p157-67 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Incompressible flow, Supersonic flow), (*Supersonic flow, Separation), Airfoils, Turbulence, Laminar flow, Boundary layer, Shear stresses, Pressure, Aerodynamic configurations, Thickness

The object of the research was to obtain measurements of pressure distribution through the reattachment region in a variety of geometrical configurations, and to study, if possible, the difference between fully laminar and turbulent reattachment. In the latter objective we were not quite successful, being able to achieve only flows with transition

ahead of separation. The conditions which determine whether reattachment is laminar or turbulent are considered.

AD-621 855 Div. 9/1 ,9/4
THERM ADVANCED RESEARCH INC ITHACA N Y
ON THE SMALL-PERTURBATION THEORY OF WATER-EXIT AND ENTRY,
by John P. Moran, and Keith P. Kerney. 1963, 30p. Contract Nonr339600 Proj. NR062 269

Unclassified report

Pub. in Developments in Mechanics. Proceedings of the Midwestern Mechanics Conference (8th), held at Case Inst. of Tech., 1-3 Apr 63. (Copies available only to DDC users).

Descriptors: (*Perturbation theory, Hydrodynamics), (*Hydrodynamics, Bodies of revolution), Water entry, Load distribution, Boundary value problems, Air-tounderwater

The hydrodynamics of a slender body of revolution in vertical motion near a horizontal air-water interface is studied. Under standard assumptions of incompressible flow and negligible air density, singularities in the body pressure distribution are unavoidable at nose and tail broach. It is shown qualitatively that these singularities can be eliminated if the air density is regarded as finite, thus facilitating a numerical solution of water-exit and entry problems. To provide initial data for such a solution, the problems are analyzed under small-perturbation assumptions, which are justifiable provided the body is not too close to the water surface. The solution obtained satisfies the boundary conditions to second-order in the square of the body thickness ratio, permitting determination of the distance from the body to the water surface required to validate the small perturbation assumptions by comparison of the first- and second-order results. (Author)

AD-621 857 Div. 9/7 ,30/4
CFSTI Prices: HC $1.00 MF $0.50
GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV
CORRELATION OF NONEQUILIBRIUM CHEMICAL PROPERTIES OF EXPANDING AIR FLOWS.
Technical information series,
by C. J. Harris, and W. R. Warren. Dec 64, 17p. Rept. no. R64SD92
Contract AF40 600 1091

Unclassified report

Descriptors: (*Nonequilibrium flow, Chemical properties), (*Hypersonic characteristics, Simulation), (*Shock tubes, Performance (Engineering)), Frozen equilibrium flow, Flight, Reentry vehicles, Atmosphere entry, Entropy, Nozzles

A correlation was presented which permits characterization of the chemical properties of air in the expanding nonequilibrium flow of a hypersonic aerodynamic test facility. This is a correlation of the non-equilibrium concentrations of the N2, O2, N, O and NO species in terms of reservoir entropy (S/R). The species concentrations are defined and are presented in units of moles per gm. of mixture. This correlation with entropy is for air expanding from a wide range of reservoir or stagnation enthalpy (H/RT sub 0 = 72 to 720) values to a nozzle area ratio (A/A*) value of 103. The gas composition at A/A* = 1,000 was determined from existing numerical computations. The reservoir entropy correlation approach is also used to define a 'percentage oxygen dissociation criterion' for the expanding flow. This criterion is them compared to previously published 'departure from equilibrium' and 'freezing' criteria. The performance of existing and proposed hypersonic and hypervelocity test facilities is considered in the context of the foregoing correlation and criteria. As an example of such facilities, and MHD augmented shock tunnel is considered in particular. (Author)

AD-621 888 Div. 9/7 ,9/5
CFSTI Prices: HC $3.00 MF $0.75
MINNESOTA UNIV MINNEAPOLIS HEAT TRANSFER LAB
UNIFORM AIR INJECTION INTO A TURBULENT BOUNDARY LAYER FLOW OVER AN AXIAL CIRCULAR CYLINDER,
by V. K. Jonsson, and C. J. Scott. Jul 65, 96p. Rept. no. HTL-TR-63
Contract AF AFOSR17 65

Unclassified report

Descriptors: (*Cylindrical bodies, Turbulent boundary layer), (*Turbulent boundary layer, Injection), (*Cooling, Turbulent boundary layer), Heat transfer, Momentum, Shear stresses, Viscosity, Friction, Velocity, Porous materials, Fluid dynamic properties

An experimental study was made of the effects of uniform air injection into the turbulent boundary layer flowing on an axial circular cylinder with a nominal free stream velocity of 120 feet per second. The blowing rate parameter divided by the free stream flow rate varied from 0 to 0.00021 while the Reynolds number based on free stream conditions varied from 400,000 to 1,060,000. The data for velocity profiles were inserted into the momentum equation and the distribution of turbulent shear stress and eddy viscosity was obtained. The correlation of eddy viscosity with both Reynolds number and injection rate was obtained by dividing by the product of the maximum shear stress velocity and boundary layer thickness. Furthermore, the results for the universal velocity profile correlate better when the maximum shear stress velocity is used rather than wall shear stress velocity. When some of the results are compared with previous experiments, the use of the maximum friction factor rather than wall friction factor in the blowing rate parameter produces better correlation between these various experiments. (Author)

AD-621 958 Div. 9/1 ,9/6 ,20/8
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ON CONCAVE BODIES IN FREE MOLECULE FLOW,
by R. Schamberg. May 65, 31p. Rept. no. P-3164

Unclassified report

Descriptors: (*Kinetic theory, Gas flow), (*Gas flow, Molecules), Drag, Heat transfer coefficients, Aerodynamic characteristics, Cylindrical bodies, Hemispherical shells, Towed bodies, Induction systems

Work by M. T. Chahine on aerodynamic forces and heat transfer for free molecule flow past concave bodies in summarized. His numerical results are presented in an alternate form which is more conducive to physical understanding of the flow and generalization to other geometries.

AD-621 987 Div. 9/6
CFSTI Prices: HC $2.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF AEROSPACE ENGINEERING AND APPLIED MECHANICS
INCOMPRESSIBLE FLOW ALONG A CORNER. PART I. BOUNDARY LAYER SOLUTIONS AND FORMULATION OF CORNER LAYER PROBLEM,
by Stanley G. Rubin. May 65, 33p. Rept. no. PIBAL-876
Contract AF AFOSR1-63 Proj. 9781 Task 978101
AFOSR , 65 1420

Unclassified report

Presented at the AGARD Fluid Dynamics Specialists' Meeting Naples Italy 10-14 May 1965.

Descriptors: (*Incompressible flow, Boundary layer), (*Boundary layer, Mathematical analysis), Aerodynamic configurations, Potential theory, Two-dimensional flow, Pressure

The incompressible viscous flow along a right-angle corner is considered. The effect of the three-dimensional geometry on the second-order 'boundary layer' flow away from the corner is determined and an interesting secondary flow is deduced. It is observed that this cross-flow prescribes the necessary asymptotic boundary conditions for the equations governing the flow inside the 'corner layer'. A systematic matching scheme is specified and the corner flow problem is reformulated in terms of the 'corner layer - boundary layer' matching conditions. (Author)

AD-622 035 Div. 9/7 ,10/7 ,27/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
INVESTIGATION OF THE MIXING OF COAXIAL HETEROGENEOUS GAS JETS AS APPLIED TO SUPERSONIC COMBUSTION.
Master's thesis,
by Gilles L. Hamelin. Aug 65, 78p. Rept. no. GA/ME/65-2

Unclassified report

Descriptors: (*Jet mixing flow, Combustion), (*Combustion, Supersonic characteristics), (*Ramjet engines, Jet mixing flow), Helium, Gas flow, Supersonic flow, Flow visualization, Schlieren photography, Boundary layer, Pitot tubes

An experimental investigation of the turbulent mixing of a sonic jet of helium discharging coaxially into a supersonic jet of air was made using a two dimensional mixing chamber. Volumetric concentration profiles were obtained and mass concentration and velocity along the jet centerline were plotted. The results indicated that both these vary inversely with the distance from the mixing origin raised to a four third power. Schlieren photography was applied in a semi-quantitative manner to confirm the validity of the above findings. This research project finds a potential application in the study and analysis of supersonic combustion ramjet engines. (Author)

AD-622 097 Div. 9/2 ,4/4
CFSTI Prices: HC $3.00 MF $0.75
AIX-MARSEILLE UNIV (FRANCE) INSTITUT DE MECANIQUE STATISTIQUE DE LA TURBULENCE
THE EQUATIONS OF COMPRESSIBLE TURBULENT GASES.
Annual summary rept. no. 1,
by A. J. Favre. Jan 65, 86p. Contract AF61 052 772

Unclassified report

Descriptors: (*Statistical mechanics, Equations), (*Compressible flow, Gases), (*Gas flow, Statistical mechanics), Equations of state, Turbulence, Continuum mechanics, France, Energy, Motion

The statistical equations for a compressible gas are developed in a general form. All the properties (density, velocity, pressure, internal energy and temperature; also viscosity, heat conductivity, and specific heats) are considered to be turbulent and are separated into macroscopic quantities and fluctuations. Freedom is retained to make the most convenient definitions of these separations at a later stage. First a complete set of equations is derived from the general form, taking as the fundamental macroscopic quantities the mean values of the velocity, the temperature, the density and the pressure. Second the choice of the most convenient fundamental macroscopic quantities is discussed, which leads to the proposed use of the mean values of the massweighted velocity, the internal energy per unit volume, the density, and the pressure. The corresponding equations have sim-

pler forms than the preceding equations, then physical interpretation is clearer, and they appear to be more convenient for theoretical work, and probably for turbulence measurements. (Author)

AD-622 120 Div. 9/1 ,2/6
MICHIGAN UNIV ANN ARBOR DEPT OF MECHANICAL ENGINEERING
GRAVITATIONAL INSTABILITY OF A VISCOUS FLUID IN A MAGNETIC FIELD,
by Chia-Shun Yih. 16 Nov 64, 8p.
AROD , 3564:6

Unclassified report

Pub. in Journal of Fluid Mechanics, v22 pt3 p579-86 1965. (Copies available only to DDC users).

Descriptors: (*Fluids, Stability), (*Gravity, Fluids), Viscosity, Magnetic fields, Heat transfer, Fluid mechanics

The instability of a viscous fluid between two infinite vertical plates and heated from below in the presence of a magnetic field perpendicular to the plates is investigated, and the most critical stability boundary in the space of the Rayleigh number R, Hartmann number M, and the horizontal wave number a is determined. It is found that the most unstable mode is a symmetric mode with zero wave-number, and that for any M the fluid is unstable for any non-zero R, however small. (Author)

AD-622 151 Div. 9/1 ,25/8
CFSTI Prices: HC $3.00 MF $0.75
NORGES TEKNISKE HOEGSKOLE TRONDHEIM INSTITUTT FOR MEKANIKK
A SIMPLIFIED APPROACH TO THE INFLUENCE OF GORTLER-TYPE VORTICES ON THE HEAT TRANSFER FROM A WALL.
Technical rept.,
by Leif N. Persen. May 65, 70p. Proj. 7063 Task 706301
ARL , 65-88

Unclassified report

Descriptors: (*Heat transfer, Laminar boundary layer), (*Vortices, Heat transfer), Turbulence, Velocity, Shear stresses, Partial differential equations

A restricted exploratory investigation was made to examine the plausibility of finding that Gortler-type vortices may explain the increased heat transfer found in many instances in which conventional explanations have failed. Because of the complexity of the analytical setting, the current treatment was put within reach of solution by restriction of the Prandtl number to high and low values, so that the energy and momentum equations may be decoupled. It is indeed found that these vortices effect increases in heat transfer and that a part of the mechanism is a tendency of the vortices to slow down the velocity in the fluid at an increased rate (as compared with the case without these vortices) in the region where they bring the fluid away from the wall and to increase it where the fluid is brought down. (Author)

AD-621 689 See Fld. 20/3

AD-621 733 See Fld. 12/1

AD-621 931 See Fld. 12/1

AD-621 998 See Fld. 15/3

AD-622 126 See Fld. 7/4

AD-622 193 See Fld. 8/6

AD-622 281 See Fld. 19/4

20/6. OPTICS

AD-621 630 Div. 25/4 ,6/6
CFSTI Prices: HC $1.00 MF $0.50
ELECTRO-OPTICAL SYSTEMS INC PASADENA CALIF
OPTICAL TRANSMITTER TECHNIQUES.
Interim rept. for 15 Jul-15 Oct 64,
Sep 65, 20p. Rept. no. 5180-Q-2
Contract AF30 602 3440 Proj. 4506 Task 450608
RADC , TR-64-526

Unclassified report

Descriptors: (*Lasers, Materials), (*Oscillators, Lasers), Rare earth compounds, Complex compounds, Fluorescence, Sensitivity, Diffusion, Heat exchangers, Excitation, Radar transmitters, Optical instruments, Gases

Work is described directed toward the design and fabrication of a gas laser oscillator and a solid-state chelate laser operating at wavelengths ranging from 5.0 to 0.3 microns. During the reporting period, the optimized material using sensitized fluorescence was tested for laser action. Under the high energy intensities of flashes, photo-reaction products are detected. This problem has been solved using new sensitizers and/or new solvents. But the quantum field is somewhat low with these sensitizers. Work is in progress to improve the quantum field. The mechanisms of the energy transfer in chelates have been further clarified and it is shown that the optical pumping scheme in the rare-earth chelate to achieve population inversion does not involve any inefficient process. (Author)

AD-621 649 Div. 25/4 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y
STUDIES ON HIGH POWER GAAS LASERS.
Final technical rept. on Proj. DEFENDER, for 1 Jun 6331 May 65,
by R. S. Title. 31 May 65, 61p. Contract Nonr413600 Proj. NR017 901

Unclassified report

Descriptors: (*Lasers, Diodes (Semiconductor)), (*Gallium alloys, Arsenic alloys), (*Diodes (Semiconductor), Lasers), Crystal growth, Electrical properties, Optical properties, Performance (Engineering)

The report is a report on the studies of factors influencing the high power operation of GaAs injection laser diodes. The report deals specifically with aspects of GaAs crystal preparation, electrical and optical characterization of the material, and with the design, parameterization, and testing of GaAs injection laser diodes. Diodes have been operated at 77K with an energy output in excess of 0.001 joules during a 120 micron sec. pulse and with an external quantum efficiency of 18%.

AD-621 702 Div. 25/4
CFSTI Prices: HC $1.00 MF $0.50
MITRE CORP BEDFORD MASS
LIGHT REFLECTIONS FROM SYSTEMS OF PLANE MIRRORS.
Technical rept.,
by D. A. Berkowitz. Sep 65, 16p. Rept. no. TM-4187
Contract AF19 628 2390 Proj. 508G
ESD , TR-65-132

Unclassified report

Descriptors: (*Mirrors, Reflection), (*Light, Reflection), (*Optical images, Rotation), Surfaces, Mathematical analysis, Design

When light from an object is reflected successively from plane mirror surfaces, a rotated image is produced. An equation is derived and tabulated values presented for the amount of rotation in terms of directions of the incident and emergent light. (Author)

AD-621 732 Div. 25/4 ,25/5
NEW YORK UNIV N Y
QUANTUM STATISTICAL DYNAMICS OF LASER AMPLIFIERS,
by A. E. Glassfold, and D. Holliday. 8 Jun 65, 3p. Contract DA ARO D31 124G666
AROD , 4614:3

Unclassified report

Pub. in Physics Letters v17 n3 p249-50 15 Jul 1965 (Copies available only to DDC users). Prepared in cooperation with RAND Corp., Santa Monica, Calif.

Descriptors: (*Lasers, Quantum statistics), (*Quantum statistics, Lasers), Dynamics, Electromagnetic fields, Field theory, Pumping (Electronics), Amplifiers

A quantum statistical procedure for analyzing radiation fields interacting with other systems has been developed and applied to a model laser operating as a linear amplifier.

AD-621 758 Div. 25/4
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PHYSICS
INCREASED IMAGE BRIGHTNESS IN A FIELD ION MICROSCOPE.
Technical rept.,
by Erwin W. Mueller, and O. Nishikawa. 14 Dec 64, 2p. Rept. no. TR-7
Contract Nonr65623 Proj. NR017 443

Unclassified report

Pub. in The Review of Scientific Instruments v36 n4 p556 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Microscopes, Images), (*Brightness, Images), Field emission, Ions, Surface properties, evaporation, Microscopy

AD-621 773 Div. 25/4 ,19/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THEORETICAL BASES OF THE AUTOREDUCING RANGE FINDER DAR-100,
by G. K. Beschasnyi. 1 Sep 65, 21p. Rept. no. FTD-MT-65-221
TT , 65-64039

Unclassified report

Edited machine trans. of Geodeziya i Kartografiya (USSR) n1 p11-23 1965.

Descriptors: (*Range finding, Theodolites), (*Theodolites, Design), Telescopes, USSR, Theory, Images, Automatic, Lenses, Micrometers

The double-image DAR-100 range finder (former designation: DAR-100 m) consists of an attachment on the telescope of a theodolite; it includes a wedge-shaped autoreduction system and the lens of a telescopic micrometer, and a vertically installed range rod with hachured scale and reverse vernier. Below are briefly outlined the basic theoretical information necessary for correct understanding of the new principle of automatic reduction applied in the DAR-100 range finder the essence of the operation of its telescopic micrometer.

AD-621 803 Div. 25/4 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
COHERENCE AND BEAM DIRECTIVITY OF AN OPTICAL RUBY OSCILLATOR.
Special trans.,

by M. D. Galanin, A. M. Leontovich, and Z. A. Chizhikova. 6 Dec 63, 5p. Rept. no. ATD-T-63-119e
TT , 65-64062

Unclassified report

Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki (USSR) v43 n1 p347-9 1962.

Descriptors: (*Crystal oscillators, Lasers), (*Lasers, Ruby), (*Ruby, Lasers), Optical properties, Light transmission, Optics, USSR

The relationship between coherence and beam directivity of a ruby laser is studied. It is shown that radiation pulses during emission occur simultaneously over the entire radiating area of the crystal.

AD-621 822 Div. 25/4
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
AMPLIFIER OF ELECTROMAGNETIC WAVES IN THE OPTICAL RANGE.
Special translation.
30 Jan 63, 3p. Rept. no. aid-T-63-18
TT , 65-64071

Unclassified report

Trans. of Russian patent 148 117, submitted 5 Aug 61, appl. 740976/26-9. Pub. in Byulleten' Izobreteniy, n12 1962.

Descriptors: (*Dielectric amplifiers, Optical equipment), (*Lasers, Dielectric amplifiers), USSR, Patents, Dielectrics, Pumping (Electronics), Rings, Dielectric properties, Coatings, Waveguides, Fiber optics

The proposed amplifier is designed in the form of a closedring dielectric fiber waveguide in order to broaden its experimental possibilities. Each fiber of the waveguide has a small or a negative coefficient of absorption and is coated with material having a reduced dielectric constant. The input and output of energy into and from the waveguide is accomplished by means of optically switched light guides. The excited state of the medium is maintained by a pumping system.

AD-621 895 Div. 25/4 ,17/7 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PHYSICS
FIELD ION MICROSCOPE.
Semiannual status rept. for 1 Apr-30 Sep 65.
Oct 65, 7p. Contract Nonr65623 Proj. NR017 443

Unclassified report

See also AD-621 756, AD-621 757, and AD-621 758.

Descriptors: (*Field emission, Microscopes), (*Microscopes, Field emission), Temperature, Image intensifiers (Electronics), Gas ionization, Ions, Helium, Nickel alloys, Beryllium alloys, Phase studies, Crystal lattices, Tantalum, Rhodium, Lasers

Results of the experimentation are summarized by abstracts of papers given at the Field Emission Symposium, held at the Pennsylvania State Univ., Sept 7-11, 1965. The papers were: Field and temperature dependence of the image brightness in a field ion microscope (FIM), Gassurface interaction in the FIM, Precipitation in a Ni-Be alloy, Elastic deformation of emitter tips by the imaging field, Impurity interstitials in tantalum and in rhodium, and Laser pulse heating of emitter tips.

AD-621 922 Div. 25/4 ,5/6
CFSTI Prices: HC $2.00 MF $0.50
TEXAS INSTRUMENTS INC DALLAS APARATUS DIV
SOLID STATE TECHNIQUES FOR MODULATION AND DEMODULATION OF OPTICAL WAVES.
Quarterly progress rept. no. 7, 1 Jan-31 Mar 65, by William R. Clendinning, and Dayton D. Eden. 21 Jun 65, 35p. Rept. no. U7-802400-7 ,08-65-144
Contract DA36 039AMC03250E Proj. 1P6 22001A056 Task 1P6 22001A056 03

Unclassified report

Continuation of Contract DA36 039SC89221. See also AD 614 712.

Descriptors: (*Light transmission, Electron optics), (*Modulation, Light transmission), (*Demodulation, Light transmission), (*Communication theory, Light transmission), Lasers, Solid state physics, Modulators, Crystals, Quartz, Diffraction gratings, Potassium compounds, Tantalum compounds, Niobates, Hydrogen compounds, Phosphates

Modulation: Preliminary tests were conducted with KTN (Potassium tantalate niobate). The observed clearing of the optical effects of crystal strains with applied bias fields is consistent with the results of an analytical development of the effect of strains in cubic crystals. Several in-cavity modulation techniques were studied, including the 45 degree Z-cut KDP configuration and also quartz in a standing-wave diffraction grating structure. Low-temperature measurements on deuterated KDP (Potassium dihydrogen phosphate) were in progress as the contract period ended. Modulator-demodulator systems: An attempt was made to transmit carrier band modulated laser light through the 1-km light pipe at Ft. Monmouth. The received light signal was of sufficient quality and intensity for good demodulator performance, but overall picture quality was poor. Failure was attributed to poor performance of standard components, in particular a poor signal level available from the rooftop antenna and excessive noise from the broadband TV booster amplifier. (Author)

AD-621 930 Div. 25/4
HUGHES AIRCRAFT CO CULVER CITY CALIF AEROSPACE GROUP
THE NATURAL SELECTION OF MODES IN A PASSIVE Q-SWITCHED LASER,
by W. R. Sooy. 14 May 65, 3p. Contract DA31 124ARO D202
AROD , 4408:1

Unclassified report

Pub. in Applied Physics Letters v7 n2 p36-7 Jul 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Electric switches), (*Electric switches, Lasers), Ruby, Oscillators, Optical equipment components, Pulse generators, Frequency

It has been observed that the use of a passive Q switch in a giant pulse ruby laser can result in a narrowing of the output spectrum. When combined with subsidiary mode seletion this has resulted in single frequency output and even total singlemode operation. A possible explanation for this effect is presented in which the mode selection is related to the mode buildup rates. Different modes will grow independently of each other (except for coupling by distortion or scattering, which is neglected until their combined power is sufficient to start depleting the ruby inversion. The process is nonlinear from that point on, but the relative mode amplitudes that have been established at that time are indicative of which modes will appear in the output pulse. It is shown that the differentiation between two modes, in terms of loss or gain, required to suppress the weaker one is inversely proportional to the number of loop transits the signal makes in building up out of the noise.

AD-621 979 Div. 25/4 ,6/6 ,6/5
CFSTI Prices: HC $3.00 MF $0.50
ELECTRO-OPTICAL SYSTEMS INC PASADENA CALIF QUANTUM PHYSICS DIV
HIGH POWER LASER AMPLIFIER CHAIN TECHNIQUES.
Quarterly progress rept. no. 1, 14 Jul-14 Oct 64, by G. L. Clark. Sep 65, 53p. Rept. no. 5550-Q-1
Contract AF30 602 3502 Proj. 4506 Task 450608
RADC , TR-64-516

Unclassified report

Descriptors: (*Lasers, Radar transmitters), (*Radar transmitters, Lasers), (*Amplifiers, Lasers), (*Space surveillance systems, Lasers), Optical tracking, Power amplifiers, Pulse amplifiers, Crystal oscillators, Neodymium, Yttrium compounds, Aluminum compounds, Garnet, Modulators, Power supplies, Optics

This report describes work directed toward the development of an optical radar transmitter using the masteroscillator-power-amplifier (MOPA) concept. The system will employ a CW YAG:Nd (3+) oscillator and a chain of amplifiers, taking advantage of the power-handling capability of neodymium-doped glass to produce adequate power for long distance surveillance. Because a laser amplifies equally well in both directions and generates noise by spontaneous decay, careful design is necessary to avoid regeneration in the amplifier chain, prevent amplifier noise in the reverse direction from swamping the oscillator, control depumping caused by superradiance, and provide a good signal-to-noise ratio in the transmitted signal. This report includes discussion of cw oscillator and pulsed amplifier designs, measurements of amplifier gain, and calculations of the limitations imposed by superradiance. (Author)

AD-622 100 Div. 25/4 ,25/5
CFSTI Prices: HC $3.00 MF $0.75
AMERICAN OPTICAL CO SOUTHBRIDGE MASS RESEARCH DIV
THEORY OF INDUCED AND SPONTANEOUS EMISSION.
Final rept. for May 64-Jun 65,
by Saul M. Bergmann. Jul 65, 96p. Contract AF19 628 4156 Proj. 4645 Task 464502
AFCRL , 65-505

Unclassified report

Descriptors: (*Lasers, Emissivity), (*Emissivity, Theory), Atomic energy levels, Photons, Frequency, Line spectrum, Quenching (Inhibition), Quantum mechanics, Field theory

The problem of induced and spontaneous emission is investigated for an atomic two-level system and incident beams of radiation which are either in a coherent state or in a stationary state (contain a definite number of photons). The frequency spectrum of the incident beam is assumed to be narrow compared to the natural linewidth of the system. The spontaneous emission for frequencies within the narrow band of the incident radiation is sharply reduced compared to the prediction of the natural line-shape. A hole is burned in the natural line-shape within the narrow frequency band, thus effectively quenching the spontaneous emission at some frequency within the band. This effect is shown to occur both for the coherent and stationary beams. Also quantities proportional to the induced and spontaneous probability amplitudes and the lifetimes are computed for times comparable to and long compared to the free lifetime of the state. (Author)

AD-622 102 Div. 25/4 ,25/7 ,30/5
CFSTI Prices: HC $4.00 MF $0.75
WESTINGHOUSE RESEARCH LABS PITTSBURGH PA QUANTUM ELECTRONICS DEPT
INVESTIGATION OF THE USE OF A LASER AS A SPECTROGRAPHIC SOURCE.
Final rept. for 1 Jun 64-31 May 65,
by G. A. Klotzbaugh, A. L. Wolfe, J. E. Paterson, and T. A. Osial. 30 Jun 65, 106p. Rept. no. 65-9C1-155-R1
Contract AF19 628 4184 Proj. 5621 ,4608 Task

562104 ,460802
AFCRL , 65-586
Unclassified report

See also AD-613 536.

Descriptors: (*Lasers, Spectroscopy), (*Spectroscopy, Lasers), Light pulses, Metals, Heating, Vaporization, Quantitative analysis

The possibilities are studied of using a laser beam in spectrographic analysis. High intensity focused laser radiation is used to bombard various metal targets. An ionized plume is thereby produced, leaving behind a small crater in the target surface. This vapor is analyzed by a conventional spectrograph, thus producing a recorded spectrum that is characteristic of the target surface. This problem is studied both experimentally and theoretically, and it is concluded that best results are obtained when the plume is cross excited by a secondary source immediately after the laser generates the plume. Two types of lasers are used in the study. One is a normal laser having a few hundred spikes of energy in each pulse. The total pulse duration is of the order of a millisecond. The second type is a giant spike laser, in which all of the energy is released in one pulse of about a hundred nanosecond duration. The merits of each as spectrographic tools are discussed. (Author)

AD-622 225 Div. 25/4 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
A BIBLIOGRAPHY OF CERTAIN OPTICAL PROPERTIES OF LIQUID WATER IN THE INFRARED REGION (1-2000 MICRONS),
by P. W. Davis. Aug 65, 18p. Rept. no. nrl bib-25
Unclassified report

Descriptors: (*Water, Optical properties), (*Infrared spectroscopy, Water), Bibliographies, Liquids, Absorption spectrum, Reflection, Refractive index, Salinity, Sea water

A selective bibliography was compiled of references pertaining to the absorption spectra, reflectance spectra and optical constants of liquid water in the infrared from 1 micron to 2000 microns. Representative curves are presented for absorption, reflectance and index of refraction. There is a serious deficiency in the scientific literature on the infrared optical properties of sea water. (Author)

AD-622 229 Div. 25/4 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
SOVIET INFRARED SENSORS. II. PHOTON DETECTORS: COMPREHENSIVE REPORT.
Rept. no. 2,
by Charles Shishkevish. 30 Sep 65, 61p. Rept. no. ATD-P-65-80
TT , 65-64120
Unclassified report

Rept. on Surveys of Communist World Scientific and Technical Literature. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Infrared equipment, USSR), (*Infrared photoconductors, USSR), Photons, Photoconductivity, Thermoelectricity, Semiconductors, Photoelectric effect, Electrons, Diodes (Semiconductor), Cadmium alloys, Mercury alloys, Tellurium alloys, Impurities

All pertinent articles published before February 1965 in the USSR dealing with photon counters based on hot-electron effects, experimental research on photoconductivity in the impurity band due to transitions between neighboring impurity centers, and experimental studies of a promising material (Cd (x)Hg (1-x)Te) for intrinsic photon counters are included. An attempt has been made to provide all of the pertinent data so as to minimize the need for referring to the original articles.

AD-622 268 Div. 25/4 ,25/6 ,6/5
CFSTI Prices: HC $1.00 MF $0.50
HUGHES AIRCRAFT CO CULVER CITY CALIF
PULSED LASER OSCILLATOR ADVANCED DEVELOPMENT MODEL.
Quarterly rept. no. 4, 1 Apr-30 Jun 65,
by E. J. Woodbury. Jul 65, 9p. Rept. no. P65-81
Contract DA 28 043AMC00326E Proj. 1P6 22001A056 03
ECOM , 00326-4
Unclassified report

See also AD-617 343.

Descriptors: (*Lasers, Space surveillance systems), Neodymium compounds, Yttrium compounds, Aluminum compounds, Garnet, Xenon lamps, Interferometers, Pumping (Electronics), Fluorescence

The report contains the supporting arguments for the change in direction of the contract from a 1500 pulse per second head to a 5000 pulse per second head, which change has just been negotiated. In addition, the results of some pertinent Company-sponsored work are given. (Author)

AD-622 283 Div. 25/4 ,30/2
CFSTI Prices: HC $3.00 MF $0.50
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
COGNITIVE NETWORKS, TECHNIQUES AND COMPONENTS (PROJECT CONTAC).
Final rept. for 13 Nov 61-24 Oct 62,
by T. R. Babcock, R. C. Friend, and P. Heggs. 24 Oct 62, 52p. Rept. no. CAL-122
Unclassified report

Descriptors: (*Pattern recognition, Artificial intelligence), (*Artificial intelligence, Pattern recognition), (*Optical equipment, Pattern recognition), (*Reading machines, Pattern recognition), Cybernetics, Optical scanning, Electron optics, Input-output devices, Optics, Computer logic, Linear systems, Character recognition

Optical-electronic techniques for implementation of linear discrimination systems indicate considerable promise for high-speed parallel pattern recognition problems. Several multiple image optical schemes have been conceived and investigated using lens and mirrors to solve the sensor to association unit interconnection problem. The A-unit activity pattern may be transmitted by multiple image lenses through weights to the response units. Fixed density A to R weights may be satisfactorily formed by the Kodak Autoscreen process. Experimental investigation of the optical and electronic techniques for the linear discriminator has resulted in the development of a single-element experimental model which has satisfactorily demonstrated the ability to dichotomize typewritten letters. Preliminary results indicate that a full scale linear discriminator model would, from the implementation considerations, be technically feasible. (Author)

AD-621 650 See Fld. 4/2

AD-621 683 See Fld. 9/1

AD-621 694 See Fld. 4/2

AD-621 711 See Fld. 17/2

AD-621 756 See Fld. 20/2

AD-621 757 See Fld. 20/2

AD-621 841 See Fld. 20/1

AD-622 091 See Fld. 20/12

AD-622 178 See Fld. 5/10

AD-622 213 See Fld. 4/2

AD-622 261 See Fld. 20/8

20/8. PARTICLE PHYSICS

AD-621 652 Div. 20/2
CALIFORNIA INST OF TECH PASADENA
P-HE4 FINAL-STATE INTERACTION IN HE3 (HE3, 2P)HE4,
by A. D. Bacher, and T. A. Tombrello. 1965, 5p. Contract Nonr22047
Unclassified report

Pub. in Reviews of Modern Physics v37 n3 p433-6 July 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Proton reactions, Helium), (*Alpha decay, Proton reactions), Nuclear reactions, Alpha spectra, Particle spectra, Alpha cross sections

The He3 (He3, 2p)He4 reaction, leading to a three-body final state consisting of an alpha particle and two protons, was investigated at bombarding energies from 3 to 18 MeV using a He3 beam from the ONR-CIT tandem accelerator. The motivation for this work was to gain an understanding of the reaction mechanism over a wide range of bombarding energy and to develop a consistent method for determining the total reaction cross section that can be extended to lower bombarding energies.

AD-621 661 Div. 25/7
CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS
MEASUREMENT OF THE L ABSORPTION SPECTRA OF XENON,
by Takeshi Watanabe. 7 Oct 64, 5p. Contract AF49 638 402 Proj. 9761 Task 976103
AFOSR , 65-1178
Unclassified report

Pub. in Physical Review v137 n5a pA1380-2 Mar 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Absorption spectrum, Xenon), (*Xenon, X-ray spectrum), Atomic energy levels, Excitation, X-ray absorption analysis

The x-ray LI, LII, and LIII absorption spectra of gaseous xenon were measured with a two-crystal x-ray spectrometer. Absolute values of the absorption coefficients were determined on both sides of each edge. It was found that the LII and LIII spectra have similar structural characteristics at the edge, each having a resonance absorption peak, while the absorption coefficient at the LI edge increases smoothly and does not exhibit the absorption peak. The jump ratios were found to be 1.12, 1.38, and 2.60 for the LI, LII, and LIII edges, respectively. An estimate was made of the oscillator strengths for the bound-bound transitions. (Author)

AD-621 675 Div. 20/1
MINNESOTA UNIV MINNEAPOLIS SCHOOL OF PHYSICS

ATOMIC MASSES OF H1, CL35, AND CL37,
by Jay L. Benson, and Walter H. Johnson,Jr.. 9 Nov 64, 3p. Contract Nonr71018
Unclassified report

Pub. in Physical Review Letters v13 n24 p724-6 Dec 14 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mass number, Hydrogen), (*Hydrogen, Mass number), (*Chlorine, Mass number), Mass spectroscopy, Stable isotopes

The results are presented of recent measurements of mass doublets which allow calculation of the mass of hydrogen and the two stable isotopes of chlorine. The measurements were made on the 16-inch mass spectrometer at the University of Minnesota with a recent refinement in the peak-matching technique.

AD-621 769 Div. 25/7
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
SPIN-CHANGE CROSS-SECTIONS FOR COLLISIONS BETWEEN ALKALI ATOMS,
by A. Dalgarno, and M. R. H. Rudge. 25 Jan 65, 6p. Contract N62558 3634
Unclassified report

Pub. in Proceedings of the Royal Society Pt. A v286 p519-24 1965 (Copies available only to DDC users).

Descriptors: (*Kinetic theory, Alkali metals), (*Alkali metals, Atomic properties), Spin, Ionization potentials, Hyperfine structure, Hydrogen

A simple procedure is described for the calculation of the interactions between two atoms at intermediate separations and the spin-change cross-sections for collisions between pairs of atoms selected from hydrogen, lithium, sodium, potassium, rubidium and caesium are calculated. Satisfactory agreement with the measured values is obtained. (Author)

AD-621 827 Div. 25/7 ,4/4
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
IMPACT IONIZATION OF SODIUM,
by D. R. Bates, Anne H. Boyd, and S. S. Prasad. 11 Feb 65, 7p. Contract N62558 4297
Unclassified report

Pub. in Proceedings of the Physical Society v85 p1121-6 1965 (Copies available only to DDC users).

Descriptors: (*Sodium, Ionization), (*Ionization, Probability), Electron bombardment, Proton bombardment, Numerical analysis, Atomic energy levels, Field theory, Great Britain

The cross sections for Na (3s) + X (yields) Na (+)+ e+X, in which X is a proton or an electron, are calculated by the first Born approximation. In the proton case the cross section obtained passes through a maximum of 1.9 x 10 to the -15 power sq cm at an impact energy of 7.6 kev, and in the electron case it passes through a maximum 5.6 x 10 to the -16 sq cm at an impact energy of 14 ev. (Author)

AD-621 917 Div. 20/1
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
NUCLEAR SPECTROSCOPY STUDIES AT SORIN'S REACTOR AVOGADRO RS1. (STUDI DI SPETTROSCOPIA NECLEARE PRESSO IL REATTORE AVOGADRO RS1 DELLA SORIN),
by L. Ciuffolotti, and F. Demichelis. 1964, 18p.
Unclassified report

Prepared for presentation at Convegno di Fisica dei Reattori Milano-Pavia (Italy) 28 Nov-1 Dec 1963 (Copies available only to DDC users). Prepared in cooperation with Torino Univ. (Italy).

Descriptors: (*Nuclear spectroscopy, Isomeric transitions), Excitation, Decay schemes, Magnesium, Antimony, Cesium, Italy

Properties and de-excitation modes of the excited levels of some short-lived radionuclides are investigated. Interest is given to the isomeric states of nuclides with neutron numbers between 50 and 82 which are considered to be weakly deformed, and for which an attempt of interpretation by a unified model is made. (Author)

AD-621 932 Div. 20/2
STANFORD RESEARCH INST MENLO PARK CALIF
ELASTIC DIFFERENTIAL SCATTERING OF HE+ IONS BY HE IN THE 20-600EV RANGE,
by Donald C. Lorents, and William Aberth. 22 Mar 65, 9p. Contract DA31 124ARO D83
Unclassified report

Pub. in The Physical Review v139 n4A p101724 16 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Elastic scattering, Differential cross sections), (*Helium, Elastic scattering), Ions, Thermal properties, Inelastic scattering

Absolute elastic differential scattering cross sections for He+ on He have been measured at relative energies of 20 to 600 eV over an angular range of 1-36 degrees. The ions are extracted from an electron-bombardment source, formed into a ribbon beam by a pair of slits, and scattered in a gas cell containing He. The scattered beam is energy-analyzed and then detected by an electron multiplier. The relative data are normalized to absolute cross sections obtained at small angles using a Faraday cage in place of the multiplier. The effect of geometry, targetparticle motion, and inelastic scattering on the angular resolution of the elastic cross sections is discussed. Three distinct interference phenomena are observed: (1) a series of smooth sinusoidal oscillations resulting from interference between the waves scattered from the gerade and ungerade potentials of the molecular ion, (2) rainbow scattering, (3) secondary oscillations at large angles due to nuclear interchange. (Author)

AD-621 945 Div. 20/2
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
PRODUCTION OF H (-) (1S2) BY HYDROGEN ATOM COLLISIONS.
by R. A. Mapleton. 8 Dec 64, 14p. Proj. 8627 Task 862706
AFCRL ,PSRP 65-438; ,115
Unclassified report

Pub. in Proceedings of the Physical Society v85 p841-4 1965 (Copies available only to DDC users).

Descriptors: (*Electron capture, Hydrogen), Excitation, Probability, Matrix algebra, Perturbation theory

The prior and post Born matrix elements are used to calculate the cross sections for H (-) (1s2) production in hydrogen atom collisions. In contrast to the original version of this work done by Mapleton in 1960, the plane wave approximation to the Coulomb function is partially corrected. The same H (-) wave functions are used, and the post cross sections are substantially unaltered. Cross sections calculated with the improved H (-) wave function as compared with the other H (-) wave functions are from twenty to thirty-five per cent larger for the prior case and twenty to thirty per cent larger for the post case. The post-prior discrepancy, expressed as a ratio, varies between 0.001 and 0.33. (Author)

AD-622 133 Div. 25/7
LIEGE UNIV COINTE-SCLESSIN (BELGIUM) INSTITUT D'ASTROPHYSIQUE
THE ABSORPTION SPECTRA OF THE MOLECULES H2, HD AND D2. PART VI. ROTATIONAL ANALYSIS OF THE B', B", D, D' AND D" STATES.
Technical note,
by A. Monfils. 2 Mar 64, 46p. Rept. no. TN-7
Contract AF61 052 587
AFCRL , 65-684
Unclassified report

Pub. in Journal of Molecular Spectroscopy v15 n3 p265-307 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Absorption spectrum, Molecular spectroscopy), (*Molecular rotation, Absorption spectrum), Atomic energy levels, Molecules, Hydrogen, Deuterium, Perturbation theory, Least squares method

The rotational levels belonging to the B', B", D, D', D" states were computed from the absorption spectra of H2, HD, and D2. The rotational analysis was worked out for these states as well as for the higher vibrational levels of the B and C states. B sub v, D sub v, and H sub v constants have been computed by least square analysis. From these data, were determined the equilibrium constants B sub e, and D sub e as well as the coupling constants alpha, beta, gamma, delta and epsilon sub e. The interatomic distances at equilibrium r have been computed and an average value for the three molecules was given for each substate. The evolution of r with the principal quantum number n is shown. (Author)

AD-622 200 Div. 20/2 ,20/5
CFSTI Prices: HC $1.00 MF $0.50
LOUISIANA STATE UNIV BATON ROUGE
UNFOLDING OF GAMMA-RAY SPECTRA BY STEPWISE STATISTICAL METHOD.
Technical rept. for Sep 64-Jan 65,
by Myron H. Young, and Narayan S. Singhal.
Jul 65, 25p. Proj. 7001 Task 700116
FDL , TR-65-86
Unclassified report

Descriptors: (*Gamma-ray spectra, Statistical analysis), Nuclear spectroscopy, Least squares method, Sequential analysis, Pulse height analyzers, Neutron activation, Radioactive fallout

The principle of the stepwise statistical methodis applied to gamma-ray spectral analysis of an unknown mixture of many radionuclides. During the multiple regression procedure the F-level tests are given sequentially for entering and removing the nuclides from a set of library spectra. The unknown spectrum is unfolded when a best fit is obtained. The computer program for IBM 7040 has the capacity to resolve a mixture containing up to 99 nuclides. Various gain settings can be used for the multichannel analyzer, and the channel drift is corrected at each run by the standard sources. The flexibility of data gathering and the advantages of the stepwise principle make this method suitable for practical analysis of mixed gamma spectra. (Author)

AD-622 239 Div. 25/7
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C

RESEARCH ON F-VALUES: REVIEW OF SOVIET LITERATURE.
AID Work Assignment no. 35, Task 21.
29 Apr 64, 69p. Rept. no. AID-U-64-31
TT , 65-64127

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Electron transitions, Atomic spectroscopy), (*Atomic spectroscopy, Electron transitions), Harmonic oscillators, Probability, Line spectrum, Atomic energy levels, Quantum mechanics, Reviews, USSR

Soviet literature on f-values of electron transitions which characterize the oscillator strength of atomic spectral lines published since 1958 is reviewed.

AD-622 258 Div. 20/1 ,25/5
CFSTI Prices: HC $1.00 MF $0.50
TRW SYSTEMS REDONDO BEACH CALIF QUANTUM PHYSICS LAB
THE ELEMENTARY PARTICLE SPECTRUM.
Technical rept.,
by H. C. Corben. Oct 65, 23p. Rept. no. 8665-6009-RU-000
Contract Nonr376900 Proj. NR013 110

Unclassified report

Descriptors: (*Elementary particles, Particle spectra), (*Quantum mechanics, Elementary particles), Relativity theory, Nuclear spins, Field theory, Parity, Operators (Mathematics), Mesons, Baryons

The relativistic quantum theory of the symmetric top implies that the spin J of a particle state can be represented as the sum of four commuting spin operators of lengths given by the positive integers or half-integers n, n', l, l'. If (l + l') is identified with the isospin, 2 (n' - n) with the strangeness, and, where applicable, (-1) to the (n + n') power with the G parity, the simplest choices of n, n', l, l' lead to a correct description of J, I, S, G for every known strongly interacting meson or baryon state. (Author)

AD-622 261 Div. 25/7 ,25/3 ,25/4
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
ABSORPTION SPECTRA OF THE PINK AND LEWISRAYLEIGH AFTERGLOWS OF NITROGEN IN THE VACUUM-UV REGION.
Physical Sciences Research papers,
by Y. Tanaka, F. R. Innes, A. S. Jursa, and M. Nakamura. 14 Oct 64, 25p. Rept. no. AFCRL-65-636 ,PSRP-128
Proj. 8627 Task 862701

Unclassified report

Pub. in Journal of Chemical Physics, v42 n4 p1183-98 Feb 15 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Wentworth Inst., Boston, Mass.

Descriptors: (*Absorption spectrum, Glow discharges), (*Glow discharges, Nitrogen), Vacuum, Ultraviolet spectroscopy, Atomic energy levels, Ground state, Vacuum, Band spectrum

The absorption spectrum of the pink afterglow of nitrogen in the 1080-1900-A region was studied in an attempt to determine the active substances responsible for the production of the afterglow. The Lewis-Rayleigh afterglow, which appears in conjunction with the pink afterglow was also studied, and various features of the two afterglows are compared. The afterglows were studied at room temperature and at liquid-nitrogen temperature. Comparison was made between the emission spectra of an ordinary discharge of nitrogen and the absorption spectrum of the pink afterglow. Most of the absorption bands observed in the pink afterglow were found to originate in the higher vibration levels of the ground state of N2, which indicates the presence of highly vibrating ground-state molecules in activated nitrogen. The upper states of the absorption bands were determined to be the b, b', g, j, m, o, q, r, and possibly other states. Bass' results are discussed and compared with those of the present work. (Author)

AD-622 272 Div. 20/2 ,12/1
CFSTI Prices: HC $2.00 MF $0.50
STANFORD RESEARCH INST MENLO PARK CALIF
RESEARCH ON METASTABLE SPECIES IN ATOMIC MOLECULAR BEAMS PRODUCED BY CHARGE TRANSFER.
Final rept. on Proj. DEFENDER,
by D. C. Lorents, and J. R. Peterson. 20 Sep 65, 38p. Contract DA31 124ARO D220 Proj. SRI PAU5027,ARPA Order553

Unclassified report

Descriptors: (*Electron capture, Molecular beams), (*Molecular beams, Production), (*Atmosphere entry, Plasma medium), Excitation, Ground state, Ion beams, Reentry vehicles, Shock waves, Wake

It is clear that excited atomic and molecular species play an important role in reentry phenomena. To understand and predict these phenomena, measured cross sections involving the excited species are required. A practical and general method of producing beams of metastable atoms and molecules is needed in order to measure these cross sections. For this use, nearresonant electron capture reactions are shown to produce excited neutral beams from ion beams with high efficiency. Total electron capture cross sections have been measured for the ions He (+) and Ar (+) in Rb and Cs in the energy range from 10 to 1500 eV. In these reactions, near energy resonances with the lowest metastable and allowed excited states of He and Ar occur, and capture into these states should be preferred. Cross sections ranging from 0.3 to 1.7 x 10 to the -14 power sq. cm were measured, the magnitude of which indicates that most of the reactions lead to excited states. A preliminary experiment with N2 (+) in Na gives strong indication of efficient production of excited N2. (Author)

AD-622 276 Div. 20/1 ,15/1
CFSTI Prices: HC $3.00 MF $0.75
UNIFIED SCIENCE ASSOCIATES INC PASADENA CALIF
STUDY OF IONIZATION POTENTIAL OF SMALL PARTICLES.
Final rept. for 16 Jul 64-15 Jul 65,
by Keung P. Luke, and Sam Naiditch. Oct 65, 94p. Contract AF19 628 4168 Proj. 8659 Task 865902
AFCRL , 65-615

Unclassified report

Descriptors: (*Ionization potentials, Particles), Aluminum, Copper, Ionization, Particle size, Work functions, Cooling

The ionization potential of small particles was studied. A photoionization technique was chosen for this measurement, using a Kingdon cage as an ion detector. Particles of aluminum and copper were produced in a helium gas. However, the suspension time of these particles in the gas was too short to permit work function measurement. As an alternative, an apparatus was constructed to produce a continuous supply of mercury particles by using a flowing stream of helium gas and a nucleating agent. In related experiments, monodispersed sulfur hydrosols and possibly cesium particles were produced. For particle-sizing work, a mobility and a simple light-scattering apparatus have been prepared. Theoretical work included analyses of the effect of particle size on particle work function, the cooling process of a hot vapor in a cooler gas and the formation mechanism of monodispersed sulfur hydrosols. (Author)

AD-621 653 See Fld. 3/1

AD-621 729 See Fld. 13/13

AD-621 747 See Fld. 13/13

AD-621 752 See Fld. 7/4

AD-621 881 See Fld. 7/4

AD-621 927 See Fld. 7/4

AD-621 953 See Fld. 8/11

AD-622 083 See Fld. 3/1

AD-622 102 See Fld. 20/6

AD-622 125 See Fld. 7/4

AD-622 225 See Fld. 20/6

AD-622 232 See Fld. 20/3

AD-622 240 See Fld. 20/3

20/10. QUANTUM THEORY

AD-622 230 Div. 25/5
CFSTI Prices: HC $1.00 MF $0.50
PITTSBURGH UNIV PA
THE RUNGE-LENZ VECTOR AND THE COULOMB GREEN'S FUNCTION,
by Levere Hostler. 1964, 17p. Contract Nonr62416 Proj. NR012 119

Unclassified report

Descriptors: (*Vector analysis, Quantum mechanics), (*Green's function, Vector analysis), Charged particles, Motion, Differential equations, Hamiltonian, Field theory

The fact that the Runge-Lenz vector is an extra constant of the motion for a charged particle moving in a Coulomb potential is found to account for the especially simple structure of the nonrelativistic coordinate space Coulomb Green's function. Also, the study of the consequences of this extra constant of the motion leads to a separation of variables in the differential equation for the coordinate space Coulomb Green's function, and hence to a new derivation of the closed form expression for this Green's function which avoids the use of infinite series and the detailed properties of special functions. (Author)

AD-621 723 See Fld. 3/1

AD-621 732 See Fld. 20/6

AD-622 100 See Fld. 20/6

AD-622 258 See Fld. 20/8

20/12. SOLID STATE PHYSICS

AD-621 659 Div. 25/6
POULTER LABS STANFORD RESEARCH INST MENLO PARK CALIF
TRAVELING FORCE ON A TIMOSHENKO BEAM,

by A. L. Florence. 1965. 9p.
Unclassified report

Pub. in Journal of Applied Mechanics Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Force (Mechanics), Beams (Structural)), (*Beams (Structural), Force (Mechanics)), Aerodynamic loading, Velocity, Supersonic characteristics, Boundary value problems, Differential equations, Integral transforms

Wave solutions are obtained by the Laplace-transform method for a semi-infinite beam subjected to a concentrated load moving at a velocity which may be supersonic, intersonic, or subsonic with respect to the bending and shearwave velocities of the beam. Curves are drawn showing the velocity distribution behind a load moving supersonically. (Author)

AD-621 705 Div. 25/6 ,25/8 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY RAPID CITY DEPT OF PHYSICS
MAGNETIC-FIELD DEPENDENCE OF THERMAL CONDUCTIVITY MEASURED BY A CORBINO-DISK METHOD.
Technical rept.,
by Robert G. Morris, David L. Burdick, and R. DanielRedin. 20 Oct 65. 18p. Rept. no. TR-15 Contract Nonr296401 Proj. NR017 208
Unclassified report

Prepared for presentation at Thermal Conductivity Conference (5th) Denver, Colo. 20-22 Oct 1965.

Descriptors: (*Semiconductors, Thermal conductivity), (*Magnetic fields, Thermal conductivity), (*Thermal conductivity, Measurement), Indium alloys, Antimony alloys, Single crystals, Disks, Electric currents

When heat flow due to charged carriers is radial in a thin cylindrical sample, a magnetic field applied parallel to the cylinder axis has maximum effect in reducing the thermal conductivity K because this Corbino-disk geometry prevents formation of a transverse temperature gradient. When a magnetic field is applied the method measures directly isothermal K; longitudinal-flow methods are likely to give approximately the adiabatic K. Measurements were made in the range 70-250C on n-InSb with fields 1000-8000 gauss. Maximum total change in K was -4%, somewhat smaller in magnitude than expected. The discrepancy may be due to lower electron mobility and to the difference in the directions of heat flow and sample growth. (Author)

AD-621 789 Div. 25/6
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
NEUTRON DIFFRACTION RESEARCH ON VITREOUS SILICA,
by G. Carraro, M. Domenici, and T. Zucca. 1964. 33p. Rept. no. SORIN-50
Unclassified report

Paper presented at the International Congress on Physics of Non-Crystalline Solids, Delft 6-10 Jul 1964 (Copies available only to DDC users).

Descriptors: (*Glass, Neutron diffraction analysis), (*Silicon compounds, Neutron diffraction analysis), (*Neutron diffraction analysis, Silicon compounds), Dioxides, Spectrum analysis, Collimators, Fourier analysis, Statistical functions

A description is given of a neutron diffractometer which was specially adapted for investigations of amorphous structures. Diffraction patterns that were obtained for vitreous silica were treated by means of inverse Fourier transforms and their radial distribution functions (RDF) were found. Because the first 2 RDF peaks were well separated, it was possible to obtain the effective coordination number of the closest neighboring atoms and to construct, theoretically, further individual peaks at higher R-values.

AD-621 793 Div. 25/6
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
RECOVERY OF THE ELECTRICAL RESISTIVITY IN VARIOUS TYPES OF PYROLYTIC CARBON AFTER NEUTRON IRRADIATION AT 196 C,
by M. Domenici, U. Perito, F. Pieragostini, and H. Walther. Apr 65. 22p. Rept. no. SORIN-56
Unclassified report

Paper presented at the Conference on Industrial Carbon and Graphite (2nd), London, Apr 1965 (Copies available to DDC users).

Descriptors: (*Carbon, Resistance (Electrical)), (*Radiation damage, Carbon), Italy, Pyrolytic graphite, Neutrons, Cryogenics, Heat of activation

The annealing of pyrolytic carbon following neutron irradiation at liquid nitrogen temperature is described by means of two series of considerations. The first one concerns the definition of suitable intervals of temperature identifying each individual process, as well as the relative limits of this picture regarding the influence of the structure of the samples and/or the dose received. The second one concerns the description of the mechanism, the nature of point-defects and the related activation energies governing the recovery in any single stage. (Author)

AD-621 840 Div. 25/6
CFSTI Prices: HC $3.00 MF $0.50
ROCKET PROPULSION LAB AIR FORCE SYSTEMS COMMAND EDWARDS CALIF
INCORPORATION OF FRACTURE INFORMATION IN SPECIFICATIONS,
by William F. Payne. 1964. 55p.
Unclassified report

Descriptors: (*Fracture (Mechanics), Specifications), (*Specifications, Fracture (Mechanics)), Stresses, Elasticity, Loading (Mechanics), Toughness, Materials, Non-destructive testing

The problem of fracture tests is examined for material and process specifications and the use of fracture toughness information is discussed in specifications for hardware acceptance, such as nondestructive inspection specifications. Emphasis is placed on the need to design properly a fracture specimen to achieve maximum use of the information obtained. The use of subsized specimens or qualitative treatment of fracture data simply reduces the ability to effectively apply test data through the design and quality control aspects of the fracture analysis cycle. A simplified analysis is presented to show the predicted effect of crack geometry variations and crack interaction effects on crack size to produce an 'equivalent crack size' effect on fracture strength of a material.

AD-621 842 Div. 25/6
GRADUATE AERONAUTICAL LABS CALIF INST OF TECH PASADENA
THE STRESSES IN A CRACKED SPHERICAL SHELL,
by Efthymios S. Folias. 21 Jul 64. 14p.
Unclassified report

Pub. in Journal of Mathematics and Physics v44 n2 p164-76 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Fracture (Mechanics), Structural shells), (*Stresses, Structural shells), Spheres, Bodies of revolution, Elasticity, Mathematical analysis

AD-621 851 Div. 25/6
FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA
TWO-DIMENSIONAL WAVE PROPAGATION IN REALISTIC VISCOELASTIC MATERIALS,
by R. J. Arenz. 5 Feb 64. 12p. Contract AF49 601 5367
Unclassified report

Pub. in Journal of Applied Mechanics Jun 1965 (Copies not available to DDC or Clearinghouse customers). Presented at the Winter Annual Meeting of The American Society of Mechanical Engineers, New York, N. J., 29 Nov-3 Dec 1964.

Descriptors: (*Shock waves, Propagation), (*Viscoelasticity, Loading (Mechanics)), Mechanical properties, Stresses, Strain (Mechanics), Integral transforms, Power series

A solution method using realistic (broad-band) viscoelastic response characteristics covering approximately ten decades of logarithmic time is presented for wave propagation in two-dimensional geometries. A dirichlet series representation of the viscoelastic mechanical properties and a numerical collocation inversion procedure overcome many of the computational difficulties associated with the Laplace-transform approach to dynamic line viscoelasticity and also afford a complete time solution. Stress distributions are given for two complementary cases, (a) the viscoelastic half-space subjected on the upper surface to the steady motion of a step pressure load moving supersonically relative to any wave speed in the material, and (b) the semi-infinite thin plate similarly loaded on its edge. (Author)

AD-621 852 Div. 25/6 ,15/1
FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA
ASYMMETRIC MIXED BOUNDARY-VALUE PROBLEMS OF THE ELASTIC HALF-SPACE,
by R. A. Westmann. 24 Jan 64. 7p. Contract AF33 616 7806
Unclassified report

Pub. in Journal of Applied Mechanics Jun 1965 (Copies not available to DDC or Clearinghouse customers). Presented at the Winter Annual Meeting of The American Society of Mechanical Engineers, 29 Nov-3 Dec 1964.

Descriptors: (*Boundary value problems, Elasticity), (*Elasticity, Boundary value problems), Integral equations, Simultaneous equations, Fourier analysis, Fracture (Mechanics)

Solutions are presented, within the scope of classical elastostatics, for a class of asymmetric mixed boundaryvalue problems of the elastic half-space. The boundary conditions considered are prescribed interior and exterior to a circle and are mixed with respect to shears and tangential displacements. Using an established integral-solution form, the problem is reduced to two pairs of simultaneous dual integral equations for which the solution is known. Two illustrative examples, motivated by problems in fracture mechanics, are presented; the resulting stress and displacement fields are given in closed form. (Author)

AD-621 859 Div. 25/6 ,17/2
SOCIETA RICERCHE IMPIANTI NUCLEARI SALUGGIA (ITALY) CENTRO RICERCHE NUCLEARI
INTERACTION BETWEEN POINT DEFECTS AND SN ATOMS IN NEUTRON IRRADIATED AL-SN ALLOY,

by S. Ceresara, and T. Federighi. 28 May 64, 6p.

Unclassified report

Pub. in Philosophical Magazine v10 n107 p893-7 Nov 1964 (Copies available only to DDC users).

Descriptors: (*Crystal lattice defects, Tin alloys), (*Tin alloys, Aluminum alloys), (*Aluminum alloys, Tin alloys), Resistance (Electrical), Heat treatment, Neutron reactions, Atoms, Radiation damage, Tin

The recovery spectrum of the extra-resistivity induced in pure Al by neutron irradiation at -195C is practically resolved in two recovery stages, conventionally indicated as stage In-2 and stage In-3, occurring in the temperature ranges -195C to -110C and -110C to 0C, respectively. The interpretation given for these stages is mainly based on the assumption that stage In-2 is due to the release and annealing of interstitials trapped at impurity atoms and that stage In-3 is due to the combination of mobile vacancy-type defects with immobile interstitial clusters formed during irradiation by the combination of single interstitials. New experimental evidence is given supporting the hypothesis that vacancy-type defects are mobile in stage In-3.

AD-621 897 Div. 25/6
CFSTI Prices: HC $4.00 MF $0.75
HARVARD UNIV CAMBRIDGE MASS DIV OF ENGINEERING AND APPLIED PHYSICS
THE EFFECT OF PRESSURE AND TEMPERATURE ON THE EFFECTIVE MASS AND ENERGY GAP OF GAAS.
Interim technical rept.,
by Walter M. DeMeis. Aug 65, 109p. Rept. no. HP-15 ,ARPA-16
Contract Nonr186610 ,SD88 Proj. NR017 308

Unclassified report

Descriptors: (*Semiconductors, Electrical conductance), Gallium alloys, Arsenic alloys, Intermetallic compounds, Cryogenics, Magneto-optic effect, Pressure, Quantum mechanics, Spectrum analyzers, Band spectrum, Refractive index, Crystal lattices, Experimental data, Tests

The report describes the results of an investigation of the effect of pressure and temperature on the energy gap and electron effective mass of GaAs. For this material, the applicability of the zero temperature Kane k.p theory at finite temperature was quantitatively tested by measuring the Faraday rotation as a function of pressure and temperature. The quantitative comparison of experimentally determined masses with theory required three subsidiary measurements: (1) the pressure change of energy gap of GaAs was found to be dE sub g/dP = (1.17 = .03).10 to the minus 5th power eV/bar; (2) the long wavelength pressure change of refractive index of GaAs was found to be (1/n) (dn/dP) = - (7.0 = 0.5).10 to the minus 7th power (1/bar); and (3) the long wavelength temperature change of refractive index of GaAs was confirmed to be (1/n) (dn/dT) = (4.5 = 0.5).10 to the minus 5th power (1/K). The results of measurements on three n-type samples of GaAs as a function of temperature and pressure show that the data were fitted best by using the Kane k.p theory at finite temperature with an energy gap corrected from O K by accounting only for lattice expansion, rather than the experimentally determined optical energy gap which may be considered to have an implicit temperature dependence due to lattice expansion and an explicit temperature dependence. (Author)

AD-621 941 Div. 25/6 ,8/2
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ELECTRIC CO SCHENECTADY N Y RESEARCH AND DEVELOPMENT CENTER
NEW SOLID-STATE DEVICE CONCEPTS.
Scientific rept.,
by M. Aven, R. O. Carlson, R. S. Ehle, R. N. Hall, and H. H. Woodbury. Jul 65, 35p. Rept. no. SR-2 ,65GC-0313G
Contract AF19 628 4976 Proj. 4608 Task 460805
AFCRL , 65-611

Unclassified report

See also AD-616 350.

Descriptors: (*Semiconductor devices, Materials), (*Lasers, Semiconductor devices), (*Cadmium compounds, Sulfides), (*Zinc compounds, Electrical properties), (*Semiconducting films, Physical properties), Oxygen, Sulfur compounds, Oxides, Sulfides, Transport properties, Electroluminescence, Selenides, Tellurides, Metal films, Silver, Gold, Aluminum, Gallium alloys, Arsenic alloys, Optical properties

Attention on CdS was shifted to stoichiometric problems and the effects of O2. Because of the high stability of SO2, firing CdS in O2 produces a 'reducing' action on the bulk crystal, equivalent to a small excess Cd firing. Electrical transport and contact properties of 1 to 10 ohm-cm ntype ZnS crystals were studied. Two types of levels were found below the conduction band of ZnS: shallow donor levels at 0.014 ev and deeper levels between 0.10 and 0.29 ev. Injection electroluminescent p-n junctions have been prepared from ZnSe0.36Te0.64 which show external quantum efficiencies of 18% at 70K. The resistance of various alloyed contacts and gold thermocompression bonds to n- and p-type GaAs was measured. The interface resistance of evaporated films of Ag, Au, and Al applied to GaAs is high unless the films are subjected to a high-temperature alloying step which damages their reflecting properties. Excellent laser diodes were made in which the p-type side was chemically etched down to within 2 microns of the junction. (Author)

AD-621 994 Div. 25/6 ,25/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
SECOND-ORDER ELASTIC CONSTANTS OF A SOLID UNDER STRESS,
by T. H. K. Barron, and M. L. Klein. 29 Sep 64, 9p.

Unclassified report

Pub. in Proc. Phys. Soc. v85 p523-32 1965 (Copies available only to DDC users).

Descriptors: (*Elasticity, Solids), (*Solids, Stresses), Strain (Mechanics), Pressure, Continuum mechanics, Crystal lattice defects, Tensor analysis

AD-622 068 Div. 25/6 ,25/2
CFSTI Prices: HC $4.00 MF $1.00
CLARENDON LAB UNIV OF OXFORD (ENGLAND)
PROPERTIES OF RARE EARTH AND TRANSITION GROUP IONS.
Final rept. for 1 Apr 63-30 Jun 65,
by B. Bleaney. 10 Jul 65, 131p. Contract AF61 052 677
AFCRL , 65-687

Unclassified report

Descriptors: (*Rare earth elements, Ions), (*Transition elements, Ions), (*Single crystals, Physical properties), Garnet, Lanthanum compounds, Aluminates, Thorium compounds, Calcium compounds, Magnesium compounds, Oxides, Phase studies, Absorption spectrum, Specific heat, Magnetic properties, Paramagnetic materials, Rubidium compounds, Potassium compounds, Fluorides, Nuclear magnetic resonance, Terbium, Dysprosium, Holmium, Impurities, Iron, Magneto-optic effect, Color centers, Atomic energy levels

Results of research in the following areas are reported: Growth and analysis of single crystals of rare-earth gallium and rare-earth aluminum garnets, lanthanum aluminate, thorium dioxide, calcium oxide, magnesium oxide, and various fluorides; optical absorption spectra of rare-earth ions in magnetic materials; specific heat and magnetic susceptibility of dysprosium and holmium trichlorides; nuclear magnetic resonance in manganese rubidium fluoride, manganese potassium fluoride, Tb, Dy, and Ho; ENDOR of Tb (4 ;) and Gd (3+) in thoria; EPR pair spectra of Tb, Ho, and Dy ethyl sulfates; magneto-optic effects in semiconducting diamond; ESR of silver chloride with Fe (2+) impurities and of U2 centers in KCl:H crystals; absorption spectra of H (-) and D (-) in calcium fluoride; ENDOR of the ground state of Tm169 (2+) in calcium fluoride.

AD-622 090 Div. 25/6 ,25/2 ,8/2
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INSULATION RESEARCH
MATERIALS RESEARCH.
Final rept.,
by A. von Hippel. Nov 65, 57p. Rept. no. TR-204
Contract Nonr184110 Proj. NR018 801

Unclassified report

Descriptors: (*Bibliographies, Materials), (*Materials, Reports), (*Scientific research, Materials), Electrical properties, Solid state physics, Dielectrics, Spectroscopy, Crystals, Crystal structure, Semiconductors, Ferroelectric materials, Magnetic materials, Ceramic materials, Instrumentation, Electric insulation

A bibliography of material research reports by the Laboratory for Insulation Research is presented.

AD-622 091 Div. 25/6 ,25/4
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE PARIS (FRANCE)
FAR-INFRARED SPECTRA OF CRYSTALS AND SOLIDS IN A LARGE RANGE OF TEMPERATURES.
Annual summary rept. no. 3, 1 May 64-30 Apr 65,
by J. Lecomte, and A. Hadni. 15 May 65, 31p.
Contract AF61 052 518
AFCRL , 65-623

Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale. See also AD-603 039.

Descriptors: (*Infrared spectroscopy, Low-temperature research), (*Crystals, Spectra (Infrared)), (*Glass, Spectra (Infrared)), Thallium compounds, Copper compounds, Halides, Rare earth compounds, Fluorides, Dysprosium compounds, Gallates, Boron compounds, Oxides, Quartz, Zinc compounds, Cadmium compounds, Tellurides, Selenides, Phonons, Impurities, France, Tellurium alloys, Cadmium alloys, Zinc alloys

Far-Infrared absorption spectra were obtained of thallium halides, copper halides, rare earth fluorides, dysprosium gallate, B2O3, quartz. Reflexion spectra of ZnTe, CdTe, ZnSe, Thallium halides and Copper halides were obtained at room temperature, liquid nitrogen, liquid hydrogen and liquid helium temperature from 40 to 900 microns. The different behaviour of crystals and glasses in the farinfrared at low temperature and the evidence of single phonon processes in glasses and ionic crystals is considered. (Author)

AD-622 145 Div. 25/6 ,15/2
TOWNE SCHOOL OF CIVIL AND MECHANICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA

STATISTICAL CONTINUUM THEORIES,
by Mark Beran. 1964, 17p. Contract DA31 124ARO D340 Grant ,DA ARO D31 124G331

AROD , 3734:8

Unclassified report

Pub. in Transactions of the Society of Rhenology v9 n1 p339-55 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Continuum mechanics, Statistical analysis), (*Statistical mechanics, Continuum mechanics), Elasticity, Stresses, Strain (Mechanics), Perturbation theory

There are presently a large number of problems in continuum physics that may be treated from a statistical point of view. In this paper we shall discuss what is meant by the statistical solution to a continuum problem. We shall initially use the nature of the stress and strain fields in a heterogeneous material as an example. We shall then emphasize the essential similarity of all statistical continuum theories. The more developed statistical continuum theories like the statistical theory of turbulence and the theory of partial coherence will be compared to the statistical theory of heterogeneous materials. For the heterogeneous material problem we shall outline a method for deriving a hierarchy of statistical moment equations from the equations of elasticity for a medium with variable elastic properties. We conclude with a discussion of the use of perturbation procedures in determining bounds for the effective elastic constants. (Author)

AD-622 150 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROELASTIC AND STRUCTURES RESEARCH LAB
SYMMETRIC DEFORMATION OF A RADIALLYCONSTRAINED THIN CIRCULAR RING UNDER INERTIA LOADING,
by L. L. Bucciarelli,Jr., and T. H. H. Pian. Jul 65, 35p. Rept. no. ASRL-TR-127-1
Contract AF AFOSR347 64
AFOSR , 65-1619

Unclassified report

Descriptors: (*Rings, Deformation), (*Loading (Mechanics), Rings), Force (Mechanics), Equations, Mathematical prediction, Nonlinear systems

This paper presents a derivation of the equations governing the elastic deformation of a thin circular ring which is acted upon by inertia loading along a direction in the plane of the ring. The ring is constrained such that no radial outward displacements are permitted. The resulting system of nonlinear equations are reduced to a convenient form which enables the application of a systematic iterative scheme for its solution. Analysis of a ring of a thickness-radius ratio of 0.01 is made. The snap-buckling behavior of the ring is indicated by a load-deflection curve. The paper also provides a simple linear analysis which is applicable to the calculation of the initial portion of the load-deflection curve.

AD-622 196 Div. 25/6 ,30/4
CFSTI Prices: HC $1.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
EVALUATION OF STRESSES IN WEB-STIFFENED CYLINDRICAL SANDWICH SHELLS SUBJECTED TO UNIFORM EXTERNAL PRESSURE,
by James A. Nott, and Gerald D. Ward. Sep 65, 18p. Rept. no. 2092
Proj. S F013 03 02 Task 1956

Unclassified report

Descriptors: (*Structural shells, Sandwich construction), (*Sandwich construction, Stiffened cylinders), (*Cylindrical bodies, Structural shells), Stresses, Mathematical analysis, Hydrostatic pressure, Strain (Mechanics), Model tests, Rings, Deformation, Submarine hulls

Four cylindrical web-stiffened sandwich models were tested under external hydrostatic pressure. Experimental strains were recorded on both outside and inside shells and compared with theoretical strains computed from existing formula developed at the David Taylor Model Basin. The differences between experimental and theoretical results were within the range of experimental error. (Author)

AD-622 209 Div. 25/6 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
COLORADO UNIV BOULDER
GALVANOMAGNETIC PHENOMENA IN SEMICONDUCTORS AT LOW TEMPERATURES.
Semi-annual letter rept. no. 2, 1 May-1 Nov 65, by W. F. Love, and S. C. Miller. 1 Nov 65, 5p.
Contract Nonr114712 Proj. NR017 462

Unclassified report

Descriptors: (*Semiconductors, Magnetic properties), Cryogenics, Resistance (Electrical), Magnetic fields, Electric fields, Transport properties, Indium alloys, Antimony alloys, Germanium

Computer calculations are in progress on the following problems: (1) Ionization energy of donor impurities in indium antimonide, (2) Magnetoresistance of p-type germanium including quantum effects, (3) Electron transport theory in high electric and magnetic fields. Experimental results on transversed magnetoresistance in pulsed magnetic fields to 185 kilogauss of single crystals of n-type germanium have been obtained. Work is in progress on measurements of electrical transport properties of n-InSb below 1K. (Author)

AD-622 246 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY RAPID CITY
HIGH-TEMPERATURE THERMAL CONDUCTIVITY MEASUREMENTS IN SEMICONDUCTORS.
Status rept. for 1 Oct 64-30 Sep 65, by Robert G. Morris. Sep 65, 8p. Contract Nonr296401 Proj. NR017 208

Unclassified report

See also AD-430 154.

Descriptors: (*Semiconductors, Thermal conductivity), Measurement, High-temperature research, Indium alloys, Antimony alloys, Silicon, Low-temperature research, Electrical conductance, Impurities

The objectives of the work are to measure the contact and bulk thermal conductivities of semiconductors at temperatures above room temperature by means of the series comparative method. To these has been added the measurement of thermal conductivity at temperatures below room temperature. Data is presented for indium antimonide and silicon.

AD-622 288 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
EQUATIONS FOR COMBINED RIGID BODY AND VIBRATIONAL PLANE MOTION OF A FREE-FREE BEAM,
by J. P. Kearns, and R. B. McCalley. 6 Apr 53, 16p. Rept. no. APL/JHU-CF-1992

Unclassified report

Descriptors: (*Beams (Structural), Motion), (*Vibration, Beams (Structural)), Acceleration, Deflection, Loading (Mechanics), Differential equations

Equations are derived for a free-free beam whose plane motion is a combination of rigid body motion and vibrational motion. After separating the vibrational motion from the rigid body motion, the concepts of effective force, mass, and stiffness are introduced for use in solving the vibration equation. (Author)

AD-622 289 Div. 25/6 ,13/4
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
VIBRATION, DAMAGE, AND DESIGN,
by Robert M. Mains. 1 Feb 55, 11p. Rept. no. APL/JHU-CF-2331
Contract NOrd7386

Unclassified report

Descriptors: (*Design, Loading (Mechanics)), (*Loading (Mechanics), Design), (*Vibration, Design), Structural properties, Structures, Geometric forms, Transportation, Mathematical analysis

In a structural design problem, it is desirable first to establish the nature and magnitude of the loads, second to determine the capacity of likely materials to withstand these loads, and third to arrange the geometry of the structure so that the materials used do not fail under the loads during the intended life of the structure. In the ordinary case of static loads or fixed-cycle repetitive loads this design process is reasonably straight-forward, with the necessary data either already available or easily determinable. When the loads are caused by transportation or flight, however, the problem takes on a different character. The difference in character arises from the fact that in addition to the statistical variation in material properties there is not another statistical variation in the loads. While it is possible to deal with 'minimum' materials properties and 'equivalent' static loads with complacency about the resulting design, this is hardly a rational process and by no means insures a safe or economical design. The problems of design for a slowly varying load and design for random vibration are considered.

AD-621 646 See Fld. 18/8

AD-621 649 See Fld. 20/6

AD-621 707 See Fld. 13/13

AD-621 739 See Fld. 20/2

AD-621 766 See Fld. 11/6

AD-621 803 See Fld. 20/6

AD-621 846 See Fld. 9/1

AD-621 872 See Fld. 9/1

AD-621 936 See Fld. 9/1

AD-622 038 See Fld. 9/3

AD-622 094 See Fld. 9/1

AD-622 123 See Fld. 20/3

AD-622 229 See Fld. 20/6

AD-622 265 See Fld. 11/6

AD-622 268 See Fld. 20/6

AD-622 278 See Fld. 21/9

AD-622 287 See Fld. 20/2

20/13. THERMODYNAMICS

AD-621 668 Div. 25/8
WISCONSIN UNIV MADISON THEORETICAL CHEMISTRY INST
KINETIC THEORY OF DENSE GASES. V. EVALUATION OF THE SECOND TRANSPORT VIRIAL COEFFICIENTS,
by David K. Hoffman, and C. F. Curtiss. 14 Dec 64, 7p. Contract NSG62 275
Unclassified report

Pub. in The Physics of Fluid v8 n5 p890-5 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Kinetic theory, Gases), (*Equations of state, Kinetic theory), Transport properties, Potential theory, N-body problem, Thermal conductivity, Viscosity, Integral equations

Numerical calculations of the corrections to the second transport virial coefficients due to three-body collisions are made for a Lennard-Jones gas, neglecting the effect of bound states. These results are compared with experiment. (Author)

AD-621 703 Div. 25/8 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
YALE UNIV NEW HAVEN CONN OBSERVATORY
DEPARTURES FROM THERMODYNAMIC EQUILIBRIUM IN A HELIUM R.F. DISCHARGE.
Interim rept.,
by B. B. Chakraborty, and L. Oster. Jul 65, 22p.
Contract AF33 615 2360 Proj. 7073 Task 707301
ARL , 65-137
Unclassified report

Descriptors: (*Gas discharges, Radiofrequency), (*Plasma medium, Thermodynamics), (*Lasers, Plasma medium), (*Helium, Gas discharges), Line spectrum, Atomic energy levels, Electron transitions, Distribution, Statistical functions, Resonance, Probability

Measurements by Crosswhite and Dieke (Am. Inst. Physics Handbook, 1957) of the visible lines of neutral helium emitted in a discharge that was excited by r.f. fields of 15 Mc frequency were used to deduce the population ratios of the various excited states. It is found that the highest states are strongly underpopulated with respect to lower excited states, that there is no significant difference between triplet and singlet populations, and that for any given principal quantum number the S state is highly overpopulated with respect to P and D states. It is concluded that the excitation takes place from the ground state, and that observed population ratios may possibly be used to predict the electron distribution function and/or the existence and amplitude of threshold resonances in the excitation cross-sections. Finally, it is pointed out that a discharge of the type discussed may act as a laser in a variety of spectral lines. (Author)

AD-621 720 Div. 25/8 ,13/1
CFSTI Prices: HC $4.00 MF $1.00
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF MECHANICAL ENGINEERING
UNCONVENTIONAL METHODS FOR INFLUENCING FLUID FLOW. PART III. THERMAL PLUMBING.
Final rept., pt. 3, Oct 63-Apr 65,
by Jon G. McGowan. Jul 65, 143p. Contract AF33 657 9914 Proj. 8169 Task 816904
APL , TR-64-133 P3
Unclassified report

Doctoral thesis. See also AD-617 725.

Descriptors: (*Fluid flow, Pumps), (*Pumps, Thermodynamics), Capillary tubes, Osmosis, Energy conversion, Semipermeability

Thermal pumping, defined as the conversion of thermal energy (heat) into mechanical pumping energy (flow work) in a device without any moving parts, is examined in detail for four major types of devices. These unconventional pumping devices used the physical effects of capillarity, thermocapillarity, osmosis, or thermo-osmosis to influence the fluid flow through a particular convertor. Each convertor is analyzed using steady-state thermodynamic considerations that restrict the operation of the device to small deviations from equilibrium conditions. This initial analysis enables such performance characteristics as maximum thermal efficiency, optimum flow rates, and maximum pressure rises to be analytically and numerically evaluated for each convertor. For the case of the capillary and osmotic pumping devices the initial performance analysis was extended to allow for arbitrarily large pressure rises through these pumping devices. On the basis of this expanded analysis, a complete numerical study yielded sets of performance curves showing the effect of varying system parameters on the performance of either device. (Author)

AD-621 783 Div. 25/8 ,25/3 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SOLVING OF ONE MIXED PROBLEM OF THERMAL RADIATION FIEL$ LHEORY,
by Yu. A. Surinov. 14 Sep 65, 26p. Rept. no. FTD-TT-65-1261
TT , 65-64046
Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n2 p78-91 1959.

Descriptors: (*Thermal radiation, Field theory), (*Field theory, Thermal radiation), Boundary value problems, Integral equations, Blackbody radiation, USSR

Given is a solution of a mixed problem concerning radiant heat exchange in a radiation system of arbitrary configuration, consisting of gray bodies, divided by a diathermal medium. It was shown, the solution of the given problem, characterized by mixed fixing of boundary conditions, is reduced to solving the fundamental set-up of the problem. The obtained results allow to generalize methods of the light field theory and serve as basis for the formulation of scientifically based methods of calculating radiant heat exchange in various technical devices, for example in high temperature electro furnaces, etc. From the derived results in role of special cases can be found all known formulas for the calculation of radiant heat exchange in systems of gray bodies, used in thermo-physics, thermo-engineering, illumination technology and helio-technology. (Author)

AD-622 190 Div. 25/8 ,17/7
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON D C
HIGH-TEMPERATURE PROPERTIES OF POTASSIUM.
Final rept.,
by C. T. Ewing, J. P. Stone, J. R. Spann, E. W. Steinkuller, and D. C. Williams. 24 Sep 65, 87p. Rept. no. NRL-6233
Contract NASA C76320
Unclassified report

Descriptors: (*Potassium, Thermodynamics), (*Thermodynamics, Potassium), Density, Vapor pressure, Liquid metals, Equations of state, Vapors, Enthalpy, Entropy, Volume, Specific heat, Hightemperature research, Experimental data, Tables

A reporting of the experimental results for potassium (saturation and superheat properties of the vapor, density and specific heat of the liquid) is presented together with a thermodynamic treatment of the data. Two equations of state are advanced, one virial and one quasi-chemical; and additional saturation and superheat properties of the vapor are derived from these equations. Either of two paths can be used in deriving absolute thermodynamic properties, the monomeric gas path or the liquid path; but results obtained by the former procedure are believed to be more accurate. Enthalpy, entropy, specific volume, specific heat, and compositional information (weight fraction of dimer, weight fraction of tetramer, and average molecular weight) are tabulated for some 800 selected vapor states in the temperature range from 1400 to 2525 F and in the pressure range from 0.2 to 35 atm. (Author)

AD-622 191 Div. 25/8 ,17/7
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON D C
HIGH-TEMPERATURE PROPERTIES OF SODIUM.
Final rept.,
by J. P. Stone, C. T. Ewing, J. R. Spann, E. W. Steinkuller, and D. D. Williams. 24 Sep 65, 62p. Rept. no. NRL-6241
Contract NASA C76320
Unclassified report

Descriptors: (*Sodium, Thermodynamics), (*Thermodynamics, Sodium), Density, Vapor pressure, Liquid metals, Equations of state, Vapors, Enthalpy, Entropy, Volume, Specific heat, High-temperature research, Experimental data, Tables

A reporting of the experimental results for sodium (saturation and superheat properties of the vapor, density and specific heat of the liquid) is presented together with a thermodynamic treatment of the data. Two equations of state are advanced, one virial and one quasi-chemical; and additional saturation and superheat properties of the vapor are derived from these equations. Either of two paths can be used to compute thermodynamic properties, the monomeric gas path or the liquid path; but results obtained by the former procedure are believed to be more accurate. Enthalpy, entropy, specific volume, specific heat, and compositional information (weight fraction of dimer, weight fraction of tetramer, and average molecular weight) are tabulated for some 700 selected vapor states in the temperature range from 1625 to 2575 F and in the pressure range from 0.2 to 25 atm. (Author)

AD-622 227 Div. 25/8 ,17/7
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON D C
HIGH-TEMPERATURE PROPERTIES OF CESIUM.
Final rept.,
by C. T. Ewing, J. P. Stone, E. W. Steinkuller, D. D. Williams, and R. R. Miller. 24 Sep 65, 56p. Rept. no. NRL-6246
Contract NASA C76320
Unclassified report

Descriptors: (*Cesium, Thermodynamics), (*Thermodynamics, Cesium), Density, Vapor pressure, Liquids metals, Equations of state, Vapors, Enthalpy, Entropy, Volume, Specific heat, High-temperature research, Experimental data, Tables

Experimental results are presented for the density and vapor pressure of the liquid and for various saturation and super-heat properties of the vapor. A virial equation of state is advanced and is used

thermodynamically to derive additional properties of the vapor. For example, enthalpy, entropy, specific volume, and specific heat are tabulated for some 1100 selected vapor states in the temperature range from 1250 to 2550 F and in the pressure range from 0.2 to 34.0 atm. (Author)

AD-621 705 See Fld. 20/12

AD-621 815 See Fld. 18/9

AD-621 831 See Fld. 20/1

AD-621 933 See Fld. 20/1

AD-622 151 See Fld. 20/4

20/14. WAVE PROPAGATION

AD-622 072 Div. 8/6 ,2/8 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
INNSBRUCK UNIV (AUSTRIA)
ON THE FREQUENCY DEPENDENCE OF THE ELECTRIC PARAMETERS OF ROCK. PROPAGATION OF VLF WAVES.
Interim scientific rept.,
by O. Worz, and Wolfram Bitterlich. 15 Jun 65, 12p. Rept. no. ISR-15
Contract AF61 052 490
AFCRL , 65-686
Unclassified report

Descriptors: (*Rock (Geology), Electrical properties), (*Wave transmission, Very low frequency), Electrical conductance, Water, Humidity, Dielectric properties, Austria

Statements on the conduction mechanism in rock and its dependence on the water content are derived from the frequency trend of E prime and E double prime measured on specimens at different water contents and on solid rock. The different results of measurements on specimens and on solid rock are discussed. (Author)

AD-622 221 Div. 8/6 ,8/2
CFSTI Prices: HC $2.00 MF $0.50
ISTITUTO UNIVERSITARIO NAVALE NAPLES (ITALY)
A PARALLEL PLATE MICROWAVE SYSTEM.
Interim scientific rept. no. 5,
by Giorgio Franceschetti, and Gabriele Rago. 15 Jul 65, 47p. Contract AF61 052 589
Unclassified report

See also AD-603 718.

Descriptors: (*Microwave equipment, Waveguides), (*Waveguides, Microwave equipment), (*Microwaves, Propagation), X band, Electromagnetic waves, Absorption, Scattering, Dielectrics, Microwave oscillators, Gain, Impedance matching, Antenna radiation patterns, Italy

A parallel plate microwave system for making scattering and reflection measurements under TEM wave conditions has been realized and tested. Theoretical analysis is confirmed by experimental results. (Author)

AD-621 692 See Fld. 9/1

AD-621 751 See Fld. 9/5

AD-621 821 See Fld. 9/1

AD-621 830 See Fld. 17/9

AD-621 908 See Fld. 4/2

AD-622 202 See Fld. 5/1

AD-622 222 See Fld. 20/3

AD-622 271 See Fld. 20/3

21. PROPULSION AND FUELS

AD-621 833 Div. 12/4 ,27/3 ,25/3
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
CESIUM ION-BEAM NEUTRALIZATION WITH ENERGETIC ELECTRONS.
Revised ed.,
by George C. Theodoridis, and Elias P. Gyftopoulos. 28 Apr 65, 4p. Contract DA36 039AMC03200E Grant ,NSF G24073
Unclassified report

Pub. in AIAA Journal v3 n8 p1414-7 Aug 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript dated 3 Aug 64.

Descriptors: (*Ion beams, Neutralization), (*Ion engines, Ion beams), (*Electrons, Ion beams), Electron guns, Plasma medium, Space charges, Cesium, Electric propulsion, Exhaust gases, Oscillation

The neutralization of the positive space charge of cesium ion beams of energies up to 2500 ev by means of energetic electrons (of the order of 100 ev) is investigated experimentally. It is found that neutralization occurs provided that electrons are supplied at the same rate as the ions. The results are independent of any other parameter of the electron beam. An attempt is made to justify the observed experimental results by means of a two-stream collective scattering interaction between the energetic electrons and the ion-beam plasma. The one-dimensional dispersion relation for this interaction indicates the existence of growing longitudinal oscillations under the conditions prevailing in the experiments. These oscillations may be the mechanism by which the electron drift energy is thermalized, thus leading to the observed neutralization. The results of this work suggest that neutralizing electrons can be introduced into the ion beam of an ion-propelled spaceship by means of an electron gun instead of being made available by placing a hot electron source in the vicinity of the ion beam. Through use of an electron gun, the electron current can be controlled continuously, and the electron emitter can be well protected. (Author)

AD-621 796 See Fld. 22

21/2. COMBUSTION AND IGNITION

AD-621 738 Div. 10/7
CFSTI Prices: HC $7.00 MF $1.75
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
COMBUSTION AND PROPERTIES OF COMBUSTIBLE SUBSTANCE,
by P. G. Demidov. 27 Aug 65, 376p. Rept. no. FTD-MT-64-381
TT , 65-64034
Unclassified report

Edited machine trans. of mono. Gorenie i Svoistva Goryuchikh Veshchestv, Moscow, 1962 264p.

Descriptors: (*Combustion, Textbooks), Flames, Thermodynamics, Oxidation, Autoignition, Ignition, Deflagration, Sparks, Vapors, Gases, Dust, Liquids, Solids, Flammability, Fire extinguishers, USSR

Contents: General information on combustion, Oxidation of combustible substances, Self-ignition; Spontaneous combustion; Ignition (deflagration); Combustible properties of mixture of vapors and gases with air; Combustible properties of dust mixtures; Burning of liquids; Burning of solid substances; Cessation of the process of burning.

AD-621 693 See Fld. 21/5

AD-621 770 See Fld. 20/4

AD-621 776 See Fld. 21/5

AD-622 035 See Fld. 20/4

21/4. FUELS

AD-621 778 Div. 10/2 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
AN ADDITIVE FOR SUPPRESSING VANATION CORROSION OF FUELS,
by R. A. Lipshtein, and A. S. Avetisyan. 20 Sep 65, 6p. Rept. no. FTD-TT-65-505
TT , 65-64042
Unclassified report

Unedited rough draft trans. of Russian patent 162 269, pub. 29 Jul 63, appl. 849707/23-4, 1p.

Descriptors: (*Fuel additives, Corrosion inhibition), Patents, USSR, Siloxanes, Vanadium, Oils, Gas turbine blades

The object of the invention is an additive for suppressing vanadium corrosion of fuels on the basis of green oil. For the purpose of improving the additive's properties tetraethoxysilane or the bottoms in the production of tetraethoxysilane is added to the green oil. (Author)

AD-621 812 Div. 10/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SOME CURRENT INFORMATION ON PROBLEMS PERTINENT TO JET FUELS.
21 Nov 62, 6p. Rept. no. AID-62-193
TT , 65-64053
Unclassified report

This report contains information on jet fuels abstracted from current Soviet literature of the 3d quarter 62.

Descriptors: (*Jet engine fuels, USSR), Aromatic compounds, Polycyclic compounds, Alkenes, Organic chemistry, Contamination, Particle size, Abstracting

This report contains information on jet fuels abstracted from current Soviet literature of the third quarter of 1962. Abstracts 1 and 2 pertain to the possible composition and sources of T-5 fuel. Abstracts 3 and 4 deal with the problem of filtrability of jet fuel from sediments of different origin. Abstracts 2 and 3 contain brief comments, while abstracts 1 and 4 are believed self-explanatory. (Author)

AD-621 816 Div. 10/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
FURTHER DATA ON T-5 FUEL.
Rept. no. 16 on AID Work Assignment no. 28.
23 Nov 62, 4p. Rept. no. AID-62-192
TT , 65-64065
Unclassified report

Descriptors: (*Jet engine fuels, USSR), Petroleum, Petroleum industry, Processing, Specifications

AD-621 818 Div. 10/2 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
SEDIMENT FORMATION IN JET FUELS, FURTHER STUDIES.
Rept. no. 10 on AID Work Assignment no. 28,
by Ya. B. Chertkov, B. I. Leontev, V. M. Shchagin, A. E. Sazonov, and B. G. Savinov. 23 Apr 62, 6p. Rept. no. AID-62-51
TT , 65-64067

Unclassified report

Trans. of Zhurnal Prikladnoi Khimii v35 n2 p394-7, 398-404 1962.

Descriptors: (*Jets engine fuels, USSR), Impurities, Organic sulfur compounds, Sulfur compounds, Electron microscopy, Thermal properties, Stability, Colloids, Organic nitrogen compounds, Organic oxygen compounds, Molecular structure, Infrared spectroscopy, Absorption spectrum, Petroleum industry, Petroleum

The two articles reported relate to the study of nonhydrocarbon compounds occurring in petroleum products and causing primarily sediment formation in jet fuels under conditions of supersonic flight. In the first article, sediment originating from sulfur compounds is examined visually, while in the second article, the chemical structure of oxygen and nitrogen compounds is investigated on the basis of their IR spectra. It is generally known that nonhydrocarbon fuel impurities which contain heteroatoms (i.e., S, O, or N) are considered primarily responsible for thermal instability of fuels.

AD-621 819 Div. 10/2 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
DESTRUCTIVE HYDROGENEATION OF AROMATIC HYDROCARBONS.
Rept. no. 9 on AID Work Assignment no. 28.
18 Apr 62, 15p. Rept. no. AID-62-49
TT , 65-64068

Unclassified report

Abstract trans. of selected articles from Akademiya Nauk SSSR. Vostochno-Sibirskii Filial, Irkutsk. Trudy, n38 153p 1961.

Descriptors: (*Aviation fuels, Production), (*Hydrocarbons, Aromatic compounds), (*Aromatic compounds, Hydrocarbons), Iron, Catalysts, Tungsten compounds, Sulfides, Tar, Coal, Petroleum, Gasoline, USSR

The table of contents lists the authors and titles of the 18 articles contained in the collection. Abstracts are included of articles with some relevance to aspects of the manufacture of T-5 fuel. In general, emphasis is given to problems of the chemistry of processes of destructive hydrogenation under high pressures and at high temperatures, to methods of identifying resultant hydrocarbons and their groups, and to the industrial application of these findings to such products as petroleum distillation residue and coal tars. The problems of fuel chemistry are approached through recently developed methods for the synthesis of aromatic hydrocarbons-typical constituents of liquid fuels.

AD-621 874 Div. 10/2 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
ANALYSIS OF DATA ON T-5 FUEL.
Rept. no. 2, on AID Work Assignment no. 28.
4 Dec 61, 18p. Rept. no. AID-61-157
TT , 65-64072

Unclassified report

Descriptors: (*Jet engine fuels, USSR), Molecular structure, Determination, Aeromatic compounds, Aliphatic compounds, Hydrocarbons, Polycyclic compounds, Petroleum, Coal

On the basis of the limited data available, this report discusses the possible composition and manufacture of the Soviet T-5 jet fuel. The elemental composition of the fuel, C14H25.5 was computed from the amount of oxygen necessary for complete combustion. The average molecular weight and the average number of carbon atoms were computed from the distillation data and boiling points of individual hydrocarbons. The group composition derived is considered highly probable, since it satisfies both the percentage of aromatics given in the specifications and the hydrogen content computed. It corresponds to a mixture of mono- and bi-cyclic aromatics (20%) and naphthenes (80%). With this probable composition as the base, the possibilities of obtaining the fuel by deep hydrogenation of the alkylated naphthalene fraction originating from coal or petroleum products were evaluated. Blending with straight-run cuts of suitable crudes a secondary possibility, was also considered. Obviously, the receipt of new data on this fuel can reverse the conclusions of this report. It should be noted, however, that existing literature on the subject contains only scattered evidence of Soviet interest in the hydrogenation of heavy materials, and no mention is made of the use of this process, which may well be classified, for the manufacture of T-5fuel. (Author)

AD-621 875 Div. 10/2
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
PHENOL AND AMINE ADDITIVES TO INHIBIT SEDIMENT FORMATION IN GAS TURBINE AIRCRAFT FUELS.
Rept. no. 6 on AID Work Assignment no. 28.
23 Jan 62, 7p. Rept. no. AID-62-11
TT , 65-64073

Unclassified report

Available only for reference use at DDC field services.

Descriptors: (*Jet engine fuels, Fuel additives), Phenols, Amines, Aviation fuels, Organic nitrogen compounds, Heterocyclic compounds, USSR

Comment is made on Russian research into additives for inhibiting sedimentation in fuels containing 30% cracking compounds. Experiments were conducted at 120C with simultaneous determination of the corrosiveness of the inhibited fuel and the extent of deposit on BB-24 bronze (4.5 to 6.2% antimony and 0.4 to 0.9% lead). Alkylated phenols, beta-naphthol, pyrocatechol, and semicoking distillation products from Cheremkhovo coals were unable to prevent or stop sedimentation, although a 50 to 70% reduction in formation was achieved. Beta-naphthol was the most effective phenol. Aromatic amines and diamines, aliphatic polyamines, and aminophenols did not achieve complete inhibition. Primary and secondary aromatic amines were better in sulfurous fuel, white tertiary aromatic amines worked better in low-sulfur fuel. Heterocyclic compounds had little effect. Of the other nitrogencontaining compounds, the amide of stearic acid inhibited sediment formation completely in hot fuel, although the sediment reappeared on cooling.

AD-621 882 Div. 10/2 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
HYDROGENATED TARS AS PROBABLE SOURCES OF T-5 FUEL.
Rept. no. 3 on AID Work Assignment no. 28.
14 Dec 61, 4p. Rept. no. AID-61-165
TT , 65-64075

Unclassified report

Descriptors: (*Jet engine fuels, USSR), Hydrogenation, Coal, Tar, Catalysts, Aeromatic compounds, Hydrocarbons, Polycyclic compounds

The two-part study of Lozovoy and associates reported does not directly refer to the production of T-5 fuel. In fact, the purpose of the study, as stated, was to formulate a simplified method of producing highly aromatic gasoline from hydrogenated coals and tars by changing the existing four-stage hydrogenation process to a single-stage process. With this end, the activity of catalysts based on acid-activated native clay -- 'Askenit' -- with oxides and sulfides of heavy metals, such as Cr, Zn, W, Mo, V, and Ni, was studied. A catalyst containing W, Cr, Zn, S, and F on activated 'Askenit' was found to produce satisfactory results in the hydrogenation of unrefined coal distillates under 300-atm pressure at 510C. Some decline in the activity of the catalyst after 97 hours of testing was noted. (1) The second part of the study describes efforts to develop similar catalysts which would be stable under hydrogenation temperature and pressure conditions. A catalyst based on activated 'Askanit' and containing oxides and sulfides of Cr, Zn, and W was found to be adequate at 501-505C under 600-atm pressure.

AD-621 883 Div. 10/2
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
THERMAL STABILITY OF JET FUELS (BIBLIOGRAPHY).
Rept. no. 1 on AID Work Assignment no. 28.
28 Sep 61, 9p. Rept. no. AID-61-165a
TT , 65-64076

Unclassified report

Descriptors: (*Jet engine fuels, USSR), Bibliographies, Aviation fuels, Petroleum industry

This report contains the selective bibliography and critical evaluation of materials examined during a preliminary scanning of the open Soviet literature for information satisfying the task requirement. The period of investigation represented is the third quarter of 1961. The six items discussed are considered to be relevant to the evaluation of Soviet efforts to improve the thermal stability of jet fuels. The use of sequence numbers for the individual items will be continued in future reports for the sake of simplifying the system of reference. (Author)

AD-621 885 Div. 10/2 ,14/5
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
AIRCRAFT AND ROCKET LUBRICANTS.
Review of book,
by M. E. Reznikov. 9 Jan 62, 7p. Rept. no. AID-62-2
TT , 65-64078

Unclassified report

Trans. of mono. Aviatsionnye i Raketnye Topliva i Smazochnye Materialy, Moscow 1960 206p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Fuels, Aircraft engines), (*Lubricants, Aircraft engines), Handling, Manufacturing methods, Test methods, Transmission, Greases, Jet engine fuels, Rocket propellants, Airplane engine oils, USSR

The book provides basic information from Soviet and nonSoviet open sources on the energy-producing capacity and physical, chemical, and operational properties of fuels and lubricants for modern aircraft engines. Problems of handling and testing of these materials are discussed, and the technology of manufacture is described in brief. The chapter on rocket fuels is based exclusively on non-So-

viet literature. The discussion of fuels is limited to the commonly known properties of gasolines and T-1 and TC-1 fuels. The book is intended for engineering personnel in aviation and rocketry and may also be useful to flying personnel. (Author)

AD-621 884 See Fld. 21/9

21/5. JET AND GAS TURBINE ENGINES

AD-621 682 Div. 27/2 ,27/1 ,27/4 ,31/5 ,+
CFSTI Prices: HC $6.00 MF $1.25
BUREAU OF SHIPS WASHINGTON D C
MARINE COMBINATION INSTALLATIONS WITH BOOSTER ENGINES,
by Boris Solomonovich Yudovin. Jul 65, 244p. Rept. no. 918
TT , 65-64027

Unclassified report

Trans. of mono. Sudovye Kombinirovannye Ustanovki s Forsazhnymi Dvigateliami, n.p. n.d.

Descriptors: (*Marine surface propulsion, Marine engineering), (*Marine engines, Multiple operation), Steam turbines, Gas turbines, Internal combustion engines, Diesel engines, Gas generator engines, Propulsion gears, Marine propulsion

This book includes material worked out and systematized by the author regarding marine power installations with booster engines for full speed. The first part examines in detail the combined installations for vessels of various purposes built or projected abroad, their systems and main equipment. The second part expounds questions regarding the theory and the planning of combined installations. Special attention has been paid to the parallel work of main engines and booster engines and to the distribution of power between them.

AD-621 693 Div. 27/2 ,10/7
CFSTI Prices: HC $2.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
ON THE CALCULATION OF THE SIMPLEST RAMJET-TYPE COMBUSTOR,
by K. P. Vlasov. 20 Sep 62, 28p. Rept. no. AID-62-125
TT , 63-13708

Unclassified report

Trans. of mono. Stabilizatsiya Plameni i Razvitie Protesessa Sgoraniya v Turbulentnom Potoke; Sbornik Statei (Stabilization of the flame and the development of the combustion process in a turbulent flow; Collection of Articles) Moscow 1961 p128-48.

Descriptors: (*Ramjet engines, Combustion), (*Combustion chambers, Ramjet engines), (*Combustion, Ramjet engines), Ignition, Mathematical analysis, Gas flow, Flames, USSR

A calculation method for the simplest ramjet-type combustor is presented. The method consists in closing the system of the basic gas-dynamic equations (of fuel-mixture flow) within a cylindrical tube with a point-ignition source, by introducing an auxiliary condition which defines the dependence of the width of the combustion zone on the distance to the ignition source. The results of the calculation were compared with some experimental data and were found to be in good agreement with them. (Author)

AD-621 776 Div. 27/2 ,10/7
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ANNULAR COMBUSTION CHAMBER OF A LOWPOWER GAS TURBINE ENGINE,
by R. M. Krivovyaz, A. S. Shteinberg, and V. S. Melnikov. 20 Sep 65, 6p. Rept. no. FTD-TT-65-504
TT , 65-64040

Unclassified report

Unedited rough draft trans. of Russian patent 165 036, pub. 30 Aug 63, appl. 854788/24-6, 1p.

Descriptors: (*Gas turbines, Combustion chambers), (*Combustion chambers, Gas turbines), Fuel systems, Vaporization, Patents, USSR

An annular combustion chamber of a low-power gas turbine engine is described which contains a fire tube, a system of fuel supply, and a vaporizing element which has the distinguishing feature that for the purpose of simplifying the design and the operation of the engine the system fuel supply is designed in the form of a single jet located in the body of an antechamber provided with an ignition plug and joined by means of a tube with vaporizing element. A chamber is described which has the distinguishing feature that the vaporizing element is designed in the form of a vaporizing collector located inside of the fire tube.

AD-621 782 Div. 27/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A SYSTEM FOR THE PROTECTION OF GAS TURBINE VANES AND DISC FROM ABRUPT COOLING DURING A SUDDEN SHUTDOWN,
by M. M. Kovalevskii, N. G. Ulyanov, and V. A. Babich. 15 Sep 65, 6p. Rept. no. FTD-TT-65-502
TT , 65-64045

Unclassified report

Unedited rough draft trans. of Russian patent 164 510, pub. 8 Apr 63, appl. 829609/24-6, 1p.

Descriptors: (*Gas turbine blades, Cooling), Valves, Fuels, Combustion chambers, Automatic, Operation, Patents, USSR

The sytem for the protection of the vanes and disc of a gas turbine from abrupt cooling during a sudden shutdown, containing a throttle for air-flow blockage, is distinguished by the fact, that, for the purpose of improving the protection of the turbine vanes and disc from abrupt cooling by providing a gradual flame-out, the system is equipped with an air-throttle-interacting and preclosure-operating system of partial (up to 25% of basic) fuel supply into the combustion chamber after closure of the check valve, and is accomplished in the form of a bypass line with an automatic valve which is gradually closed by means of a servomotor. (Author)

AD-621 892 See Fld. 1/3

AD-621 893 See Fld. 1/3

AD-622 035 See Fld. 20/4

AD-622 245 See Fld. 21/7

21/7. RECIPROCATING ENGINES

AD-622 245 Div. 27/1 ,27/2
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
AKADEMIYA NAUK SSSR. INSTITUT DVIGATELEY. A PRELIMINARY UNEDITED REPORYT.
4 Dec 64, 81p. Rept. no. ATD-U-64-155
TT , 65-64133

Unclassified report

Compilation of Soviet material pub. 1954-64.

Descriptors: (*Engines + motors, Scientific research), (*Internal combustion engines, Scientific research), USSR, Bibliographies, History, Personnel, Scientific organizations

The report is a preliminary, partially edited, compilation of Soviet material on Institut Dvigateley (Engine Institute) published during 1954-1964. The material is divided into three sections, covering the history and organization of the Institute, its personnel, and their publications. The section on personnel is subdivided into part A, which deals with those people who are known members of the Institute, and part B, which lists those who have some connection with the Institute but have not been identified positively as members. Library of Congress call numbers appear at the right, at the end of the main entry, whenever the source is cataloged in the Library of Congress collections. No location symbols are used for sources that either are not cataloged at this time, or uncataloged materials now available in the various divisions of the Library of Congress, or sources identified in references but which cannot be located. Abstracts of articles are given when available. An abstract and a translated table of contents of B.S. Stechkin's textbook Reaktivnyye Dvigately are included as an appendix to the bibliography.

AD-621 682 See Fld. 21/5

21/8. ROCKET MOTORS AND ENGINES

AD-621 833 See Fld. 21

AD-622 118 See Fld. 11/7

21/9.1 LIQUID ROCKET PROPELLANTS

AD-621 884 Div. 10/5 ,10/2 ,14/5
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE INFORMATION DIV LIBRARY OF CONGRESS WASHINGTON D C
ALIPHATIC PRIMARY AMINES AS ANTIOXIDANT AND SEDIMENT DISPERSING ADDITIVES TO T-1 FUEL.
29 Dec 61, 7p. Rept. no. AID-61-173
TT , 65-64077

Unclassified report

Descriptors: (*Jet engine fuels, Amines), (*Lubricant additives, Amines), Fuels, Aliphatic compounds, Antioxidants, USSR

The heating of fuel samples (25 ml) was carried out in a thermostability testing device at temperatures from 100 to 200 C, with and without catalytically acting copper plate. The following inferences are drawn: (1) the sediment formation in heated T-1 fuel is inhibited by the addition of aliphatic primary amines, and this effect increases with the increase of the chain length of the organic radical, from C7-9 to C15; (2) the formation of oxidation products increases in the presence of the amines; a weak antioxidant effect is noted in the reverse order of amines as compared with the sediment formation; (3) the change in the amount and structure of the sediments and the size and the shape of the particles is caused by the antioxidant and by the dispersing properties of amines at certain temperatures, and possibly by the coagulating property at higher temperatures; (4) the mechanism of the dispersing effect is believed to consist in the absorption of the amines around the sediment particles in the form of envelopes which prevent coagulation; (5) the mechanism of coagulation possibly lies in the contact of the liquid part of the mixed (i.e., liquid + solid) phase of the sediment. The solid part is believed to soften and melt at elevated temperatures. (Author)

21/9.2 SOLID ROCKET PROPELLANTS

AD-622 278 Div. 10/6 ,4/2 ,25/2 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
A FEASIBILITY STUDY TO INCREASE THE ACTIVITY OF OXIDES WITH OXYGEN AND TO LOWER THE IGNITION TEMPERATURE OF SLURRY METALS.
Quarterly progress rept. for 1 May-31 Jul 65,
by Eli S. Freeman, Aaron J. Becker, and WinfriedRudloff. 21 Sep 65, 49p. Rept. no. IITRI-C-6066-3
Contract AF33 615 2688 Proj. IITRI C6066
Unclassified report

Descriptors: (*Rocket propellants, Combustion), (*Cobalt compounds, Oxidation-reduction reactions), (*Boron, Combustion), Palladium compounds, Oxides, Palladium, Solid-state physics, Impurities, Crystal lattice defects, Radiation damage, Slurry fuels, Powders, Powder metals, Reaction kinetics, Lithium, Silver, Ions, Decomposition

The main objective was to commence with the investigation on the influence of doping and of preexposure to gamma ray radiation on the reversible oxidation-decomposition reactions of cobalt oxide, Co3O4 yields reversibly 3CoO + 1/2 O2. The principal experimental techniques used were differential thermal analysis (DTA) and thermogravimetrical analysis (TGA). The results indicate that doping cobalt oxide with foreign cations can significantly alter its high temperature chemical reactivity characteristics. Li (+) ion is especially effective as a doping agent to decrease the decomposition reaction temperature and increase the reaction rate. In some cases such as where the oxide is doped with Li (+) or Ag (+1) ions the oxidation or decomposition reaction appears to occur in two steps. (Author)

22. SPACE TECHNOLOGY

AD-621 746 Div. 12/6 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
DISTRIBUTION OF LOOK ANGLES TO A NEAR SYNCHRONOUS SATELLITE.
Technical note,
by Maxine H. Simon. 8 Sep 65, 9p. Rept. no. TN-1965-47
Contract AF19 628 5167
ESD , TDR-65-425
Unclassified report

Descriptors: (*Synchronous satellites, Tracking), Pogramming (Computers), Orbital trajectories

There is interest in determining the distribution of look angles to a near synchronous equatorial satellite for ground stations at various latitudes. A computer program was written to determine these distributions with ground station latitude and minimum acceptable look angle as parameters. (Author)

AD-621 796 Div. 12/6 ,12/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE TOMORROW OF AVIATION (SELECTED ARTICLES).
15 Sep 65, 15p. Rept. no. FTD-TT-65-745
TT , 65-64051
Unclassified report

Unedited rough draft trans. of Nauka i Tekhnika (Latvian SSR) n1 p37-40 1965.

Descriptors: (*Aerospace planes, USSR), (*Launch vehicles (Aerospace), USSR), Manned spacecraft, Hypersonic planes, Jet propulsion, Rocket propulsion, Space propulsion, Solar sails, Inflatable structures

AD-621 808 Div. 12/6 ,12/3 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
PRELIMINARY RESULTS OF SPACE FLIGHTS OF A. NIKOLAEV AND P. POPOVICH,
by O. Gazenko, and A. Genin. 31 Aug 62, 3p.
Rept. no. A1D-62-131
TT , 65-64057
Unclassified report

Incomplete trans. of Pravda, Moscow (USSR) 18 Aug 1962 p4.

Descriptors: (*Space medicine, USSR), (*Space flight, USSR)

The flights of A. Nikolaev and P. Popovich were conducted in order to determine the effects of unusual physical conditions (weightlessness, cosmic radiation, etc.) encountered in space on man's physiological functions, work capacity and mental status in prolonged space flights. It was also necessary to determine the effectiveness of preflight training, and to evaluate the accuracy of calculations made of man's requirements of food, water, and oxygen, and the suitability of the hygienic conditions in the spaceships cabin.

AD-621 861 Div. 12/6 ,12/1
TRW SPACE TECHNOLOGY LABS REDONDO BEACH CALIF
INSTABILITY OF SPINNING SPACE STATIONS DUE TO CREW MOTION.
Revised ed.,
by W. T. Thomson, and Y. C. Fung. 16 Nov 64, 6p.
Unclassified report

Pub. in AIAA Journal v3 n6 p1082-7 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 4 May 64.

Descriptors: (*Space stations, Stability), Space crews, Motion, Space flight, Spin, Equations

The stability of a spinning space station due to periodic motions of the crew is considered. It is shown by a few examples that instability may occur if the period of an astronaut's motion bears certain ratios to the half-period of the satellite. For example, if he moves back and forth along a radius of a circular, planar satellite, instability will occur when the period of his motion is approximately an integral multiple of the half-period of the satellite spin. A similar conclusion holds if the astronauts move constant speed or oscillate periodically in circumferential direction. The heavier the moving masses are, relative to the satellite, or the larger their amplitude of motion, the wider will be the regions of instability. General equations are given which are useful for analyzing other modes of crew motion of for other problems such as passive damping of a spinning satellite. (Author)

AD-622 033 Div. 12/6 ,29/6
CFSTI Prices: HC $2.00 MF $0.50
SYSTEMS ENGINEERING GROUP RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A THREE-MASS RETRIEVAL STUDY FOR THE GEMINI TETHERED ASTRONAUT.
Technical rept. for Jan-Mar 65,
by Corrado R. Poli, and Ernest P. Hanavan,Jr.,
Jul 65, 34p. Rept. no. SEG-TR-65-29
Proj. 7184 Task 718405
Unclassified report

Descriptors: (*Astronauts, Mooring), Spacecraft, Equations, Anchors (Structural), Mathematical models, Force (Mechanics), Velocity, Astronautics

A mathematical model is developed and used to investigate the feasibility of a three-mass retrieval technique considered for a future Gemini extravehicular operation. The technique consists of an astronaut moving along a tetherline connected between the Gemini spacecraft and an 'anchor mass' in space. The mathematical model is obtained by writing the rotational equations of motion for a rigid body spacecraft, the translational equations of motion for a 'point-mass' man and a 'point-mass' anchor, and the equations of constraint relating the distance between the Gemini spacecraft, the astronaut, and the anchor mass. The trajectories of the astronaut and the anchor mass with respect to the spacecraft, the forces of constraint on the astronaut, and the angular-velocity components of the spacecraft are determined by solving the equations using various initial conditions for the astronaut, the anchor mass, and the spacecraft. Line-wrap, excessive spacecraft rotation rates, and excessive terminal velocities of the astronaut cause the retrieval technique to be considered unacceptable. (Author)

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and field/group. A typical subject index entry is shown below.

*ALUMINUM
GLASS TEXTILES
INVESTIGATION OF GLASS-METAL COMPOSITE MATERIALS
AD-619 773 FLD. 11/7

PERSONAL AUTHOR INDEX

The Personal Author Index is arranged alphabetically by the last names of the authors of reports. When several report entries are given for one author, the entries are arranged numerically by AD number. Field/group and titles are also listed. Three asterisks serve as a separator between entries for reports under the same author. A typical personal author entry is shown below.

*CHASE, JOHN W.
* * *
THE LANTHANUM, EUROPIUM, AND DYSPROSIUM CONTENTS OF TWO TEKTITES
AD-619 828 FLD. 8/7
* * *
A PROCEDURE FOR GEOCHEMICAL INTERPRETATION OF TERRESTRIAL RARE-EARTH ABUNDANCE PATTERNS
AD-619 834 FLD. 8/7

CORPORATE AUTHOR-MONITORING AGENCY INDEX

The Corporate Author-Monitoring Agency Index is arranged alphabetically by corporate authors and monitoring agencies.

In the corporate author entry for each document are listed the originator of the report, the originator's report number, the title, AD number, and field/group. If the source has listed a monitoring agency in the report, the monitor acronym and monitor series number are given in parenthesis directly under the title. An IDEP (Interservice Data Exchange Program) report number is presented in the same way. A typical corporate author entry is shown on the next page.

792-811 O - 65 - 7

*AEROJET- GENERAL CORP AZUSA
CALIF

* * *

TR3015
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
(AFOSR 65-1058)
AD-619 513 FLD. 7/4

The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC
RESEARCH WASHINGTON D C

* * *

65-1058
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
AD-619 513 FLD. 7/4

CONTRACT INDEX

The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and field/group.

When there are multiple document entries under one contract number, entries are arranged by AD number under each corporate author represented.

A contract entry may also contain a letter F, A, or S on the left-hand margin, indicating that the document is a Final, Annual, or Summary report. A typical contract entry is shown below.

*AF19 628 5167
LINCOLN LAB MASS INST OF TECH
LEXINGTON
(ESD TDR-65-315)
AD-619 580 FLD. 9/5
(ESD TDR-65-309)
AD-619 708 FLD. 3/1

AD-FIELD INDEX

The AD-Field Index is arranged numerically by AD number and lists the field/group where the full entry can be located in TAB.

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LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF MATERIALS SCIENCES LAB
AD-622 234 FLD.11/6

•AF33 697 11073
TEXAS UNIV AUSTIN
(ARL 69-171)
AD-622 088 FLD.20/3

•AF33 697 11729
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
(AMRL TR-69-110)
F AD-622 298 FLD.5/10

•AF33 697 7979
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB
(ARL 69-121)
F AD-621 689 FLD.20/3

•AF33 697 8777
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF
AD-621 629 FLD.9/2

•AF33 697 8802
MICHIGAN UNIV ANN ARBOR ACOUSTICS AND SEISMICS LAB
05978 6 F
AD-621 634 FLD.20/1

•AF33 697 9914
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF MECHANICAL ENGINEERING
(APL TR-69-133 P3)
F AD-621 720 FLD.20/13

•AF40 600 1091
GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV
R64SD92
AD-621 897 FLD.20/4

•AF49 601 5367
FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA
AD-621 891 FLD.20/12

•AF49 638 1284
COLUMBIA UNIV NEW YORK PLASMA LAB
19
AD-621 990 FLD.20/3

•AF49 638 1327
CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB
AD-621 761 FLD.8/11

•AF49 638 1327 GRANT
CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB
AD-621 721 FLD.8/6

•AF49 638 1430
JOHNS HOPKINS UNIV BALTIMORE MD
(AFOSR 69-1243)
AD-621 696 FLD.20/2

•AF49 638 1583
AVCO EVERETT RESEARCH LAB EVERETT MASS
AMP 166
AD-621 860 FLD.20

•AF49 638 402
CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS
(AFOSR 69-1178)
AD-621 661 FLD.20/8

•AF49 638 644
COLUMBIA UNIV NEW YORK DEPT OF MATHEMATICS
(AFOSR TR-60-173)
AD-621 863 FLD.12/1

•AF49 638 700
RAND CORP SANTA MONICA CALIF
RM 4717 PR
AD-621 869 FLD.12/1

•AF49 638 718
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
(AFOSR 266)
AD-621 862 FLD.7/2

•AF61 052 490
INNSBRUCK UNIV (AUSTRIA)
ISR 19
(AFCRL 69-686)
AD-622 072 FLD.20/14

•AF61 052 918
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE PARIS (FRANCE)
(AFCRL 69-629)
AD-622 091 FLD.20/12

•AF61 052 987
LIEGE UNIV COINTE-SCLESSIN (BELGIUM) INSTITUT D'ASTROPH YSIQUE
TN 7
(AFCRL 69-684)
AD-622 133 FLD.20/8
LIEGE UNIV (BELGIUM) DEPT OF ASTROPHYSICS
TN 8
(AFCRL 69-685)
AD-622 083 FLD.3/1

•AF61 052 989
ISTITUTO UNIVERSITARIO NAVALE NAPLES (ITALY)
AD-622 221 FLD.20/14

•AF61 052 619
KIRUNA GEOPHYSICAL OBSERVATORY (SWEDEN)
SR 4
(AFCRL 69-688)
AD-622 222 FLD.20/3
(AFCRL 69-683)
F AD-622 229 FLD.20/3

•AF61 052 679
INNSBRUCK UNIV (AUSTRIA)
INST FOR THEORETICAL PHYSICS
SR 18
AD-622 093 FLD.20/3

•AF61 052 677
CLARENDON LAB UNIV OF OXFORD (ENGLAND)
(AFCRL 69-687)
F AD-622 068 FLD.20/12

•AF61 052 772
AIX-MARSEILLE UNIV (FRANCE) INSTITUT DE MECANIQUE STATI STIQUE DE LA TURBULENCE
AD-622 097 FLD.20/4

•ARO D31 1246377
OREGON UNIV EUGENE
(AROD 3719:3)
F AD-622 279 FLD.7/3

•AT11 1 209
INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY
AD-621 966 FLD.6/1

•AT11 1 34
CALIFORNIA UNIV BERKELEY
AD-621 838 FLD.6/9

•AT49 8 2110
NAVAL RESEARCH LAB WASHINGTON D C
NRL MEMO. REPT.
AD-621 867 FLD.18/9

•AT49 7 2341
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF

TPR 398
AD-621 999 FLD.1/3

•DA ARO D31 1246141
CINCINNATI UNIV OHIO DEPT OF CHEMISTRY
(AROD 3118:7)
AD-622 138 FLD.7/3
(AROD 3118:8)
AD-622 140 FLD.7/4

•DA ARO D31 1246284
WASHINGTON UNIV SEATTLE DEPT OF CHEMISTRY
AD-621 734 FLD.7/3

•DA ARO D31 1246278
MINNESOTA UNIV MINNEAPOLIS SCHOOL OF CHEMISTRY
(AROD 3169:3)
AD-621 667 FLD.7/4

•DA ARO D31 1246331
TOWNE SCHOOL OF CIVIL AND MECHANICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
(3734:8)
AD-622 145 FLD.20/12

•DA ARO D31 1246362
WASHINGTON UNIV SEATTLE DEPT OF CHEMISTRY
AD-621 734 FLD.7/3

•DA ARO D31 1246378
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY
(AROD 2674:11)
AD-621 626 FLD.7/3

•DA ARO D31 1246391
LOYOLA UNIV CHICAGO ILL DEPT OF CHEMISTRY
(AROD 2459:9)
AD-621 927 FLD.7/4

•DA ARO D31 1246409
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY
(AROD 1112:22)
AD-621 837 FLD.7/3

•DA ARO D31 1246432
NORTH CAROLINA UNIV CHAPEL HILL
(AROD 2776:17)
AD-622 297 FLD.12/1

•DA ARO D31 1246600
WESTERN RESERVE UNIV CLEVELAND OHIO DEPT OF MATHEMATICS
(AROD 2828:9)
AD-621 980 FLD.12/1

•DA ARO D31 1246666
NEW YORK UNIV N Y
(AROD 4619:3)
AD-621 732 FLD.20/6

•DA ARO D31 1246678
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF MATHEMATICS
(AROD 223:64)
AD-621 733 FLD.12/1

•DA MD49 193 646120
MICHIGAN UNIV ANN ARBOR DEPT OF PSYCHOLOGY
06091 1 F
F AD-621 914 FLD.5/10

•DA 28 043AMC00926E
HUGHES AIRCRAFT CO CULVER CITY CALIF
P69 81
(ECOM 00926-4)
AD-622 268 FLD.20/6

•DA11 190ENG91
MIAMI UNIV CORAL GABLES FLA
(CRREL RR-141)
AD-622 192 FLD.8/6

•DA18 108AMC2958A
ALABAMA UNIV BIRMINGHAM SCHOOL OF CHEMISTRY METALLURGY AND CERAMICS
F AD-621 899 FLD.6/15

•DA19 129AMC87N
AMERICAN MEAT INST FOUNDATION CHICAGO ILL
(USA NLABS FD-23)
F AD-621 849 FLD.6/1

•DA19 129MN1899 OI 5147
GENERAL FOODS CORP WHITE PLAINS N Y TECHNICAL CENTER
(USA NLABS FD-17)
AD-622 087 FLD.6/8

•DA19 129MN1966
DARTMOUTH COLL HANOVER N H
GEOGRAPHY PUB 2
AD-622 073 FLD.4/2

•DA19 129MN2039
OREGON STATE UNIV CORVALLIS
(FD 24)
F AD-621 921 FLD.6/8

•DA22 079ENG339
COLORADO SCHOOL OF MINES RESEARCH FOUNDATION INC GOLDEN
(AEWES TR-3-698 V2)
AD-621 747 FLD.13/13

•DA28 043AMC00079E
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
R 266
AD-621 928 FLD.9/1

•DA28 043AMC00122E
INTERMOUNTAIN WEATHER INC SALT LAKE CITY UTAH
AD-621 690 FLD.4/2

•DA28 043AMC00478E
MOTOROLA INC CHICAGO ILL COMMUNICATIONS DIV
AD-622 069 FLD.17/2.1

•DA28 043AMC01240E
LOWELL TECHNOLOGICAL INST RESEARCH FOUNDATION MASS
17
AD-621 739 FLD.20/2

•DA30 070CML1290
GENERAL TIRE AND RUBBER CO WABASH IND INDUSTRIAL PRODUCTS DIV
F AD-621 869 FLD.15/2

•DA31 124ARO D159
MICHIGAN STATE UNIV EAST LANSING DEPT OF CHEMISTRY
AD-622 134 FLD.7/2

•DA31 124ARO D202
HUGHES AIRCRAFT CO CULVER CITY CALIF AEROSPACE GROUP
AD-621 930 FLD.20/6

•DA31 124ARO D220
STANFORD RESEARCH INST MENLO PARK CALIF
F AD-622 272 FLD.20/8

•DA31 124ARO D253
NEW YORK UNIV N Y LAB FOR ELECTROSCIENCE RESEARCH
(AROD 4949:2)
F AD-621 801 FLD.9/4

•DA31 124ARO D289
MICHIGAN UNIV ANN ARBOR DEPT OF CHEMISTRY
(AROD 5092:3)
AD-622 146 FLD.6/1
AD-622 149 FLD.7/3

•DA31 124ARO D33
FIRESTONE FLIGHT SCIENCES LAB CALIF INST OF TECH PASADENA
AD-621 669 FLD.20/4

•DA31 124ARO D331
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
ORC 69 30
AD-621 864 FLD.12/1

•DA31 124ARO D340 GRANT
TOWNE SCHOOL OF CIVIL AND MECHANICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
(3734:8)
AD-622 145 FLD.20/12

•DA31 124ARO D83
STANFORD RESEARCH INST MENLO PARK CALIF
AD-621 932 FLD.20/8

•DA36 039ORD3672RD
DREXEL INST OF TECH PHILADELPHIA PA
DIT 125 7
AD-621 710 FLD.19/4

•DA36 039AMC01477E
SPERRY MICROWAVE ELECTRONICS CO CLEARWATER FLA
SJ 222 0045 8
AD-622 094 FLD.9/1

•DA36 039AMC02164E
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
AD-622 089 FLD.9/1

•DA36 039AMC02195E
TEXAS A AND M UNIV COLLEGE STATION DEPT OF OCEANOGRAPHY AND METEOROLOGY
10
AD-621 728 FLD.4/2

•DA36 039AMC02249E
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
AD-621 727 FLD.9/1

•DA36 039AMC02300E
GENERAL TELEPHONE AND ELECTRONICS LABS INC BAYSIDE N Y
TR 69 102.8
(ECOM TR-02300-F)
F AD-621 846 FLD.9/1

•DA36 039AMC02369E
ELCON LAB INC PEABODY MASS
AD-621 745 FLD.17/9

•DA36 039AMC03200E
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-621 834 FLD.6/16
AD-621 901 FLD.9/4

•DA36 039AMC03200E GRANT
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-621 832 FLD.9/4
AD-621 833 FLD.21
AD-621 839 FLD.9/4

•DA36 039AMC03249E
WESTINGHOUSE ELECTRIC CORP ELMIRA N Y ELECTRONIC TUBE DIV
F AD-621 683 FLD.9/1

•DA36 039AMC03290E
TEXAS INSTRUMENTS INC DALLAS APPARATUS DIV
U7 802400 7
AD-621 922 FLD.20/6

•DA36 039AMC03294E
SPERRY MICROWAVE ELECTRONICS CO CLEARWATER FLA
F AD-621 915 FLD.17/9

•DA36 039AMC03617E
WESTINGHOUSE ELECTRIC CORP PHILADELPHIA PA
AD-621 856 FLD.9/1

•DA36 039AMC03620E
HAMILTON STANDARD DIV UNITED AIRCRAFT CORP BROAD BROOK CONN
HSER 3078
F AD-622 256 FLD.9/1

•DA36 039AMC03633E
BULOVA WATCH CO WOODSIDE N Y ELECTRONICS DIV
AD-621 896 FLD.9/1

•DA36 039AMC03635E
PIEZO CRYSTAL CO CARLISLE PA
AD-622 206 FLD.9/1

•DA36 039AMC06160E
TEXAS INSTRUMENTS INC DALLAS SEMICONDUCTOR-COMPONENTS DIV
03 65 69
AD-621 873 FLD.9/1

•DA36 039SC86734
WESTON INSTRUMENTS INC ARCHBALD PA
AD-621 891 FLD.9/1

•DA36 039SC87461
HAMILTON STANDARD DIV UNITED AIRCRAFT CORP BROAD BROOK CONN
HSER 3089
F AD-622 267 FLD.10

•DA36 039SC89080
COLORADO STATE UNIV FORT COLLINS DEPT OF ATMOSPHERIC SCIENCE
F AD-621 866 FLD.4/2

•DA36 039SC89111
MIAMI UNIV CORAL GABLES FLA INST OF MARINE SCIENCE
8226 8
F AD-622 092 FLD.4/2

•DA36 039SC89153
CALIFORNIA UNIV BERKELEY
F AD-621 824 FLD.10

•DA36 039SC90854
TECHNOLOGY INC DAYTON OHIO
F AD-622 119 FLD.4/2

•DA44 009AMC9307
HOLMAN (JOHN F) CO INC WASHINGTON D C
AD-621 936 FLD.9/1
AD-621 937 FLD.20/2
(AERDL T-1804-651)
AD-621 938 FLD.20/2
(AERDL T-1805-651)
AD-622 095 FLD.13/2

•DA44 177AMC191T
AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ
(USAAVLABS TR-65-43)
F AD-621 718 FLD.1/3

•DA44 177AMC877T
HUGHES TOOL CO CULVER CITY CALIF AIRCRAFT DIV
HTC AD 64 11 (385 X 09)
(USAAVLABS TR-65-29)
F AD-621 684 FLD.1/3

•DA49 007MD1024 GRANT
WASHINGTON UNIV ST LOUIS MO SCHOOL OF MEDICINE
AD-621 670 FLD.6/1
AD-621 671 FLD.6/16
AD-621 672 FLD.6/1

•DA49 007MD511 GRANT
HARRISON DEPT OF SURGICAL RESEARCH UNIV OF PENNSYLVANIA PHILADELPHIA
AD-622 211 FLD.6/5

•DA49 193MD2163
YALE UNIV NEW HAVEN CONN SCHOOL OF MEDICINE
AD-621 983 FLD.6/16
AD-621 984 FLD.6/16

•DA49 193MD2163 GRANT
YALE UNIV NEW HAVEN CONN SCHOOL OF MEDICINE
AD-621 985 FLD.6/16
AD-621 986 FLD.6/16

•DA49 193MD2238
MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY
(TT 65-64118)
AD-622 210 FLD.6/3

•DA49 193MD2357 GRANT
BAYLOR UNIV HOUSTON TEX COLL OF MEDICINE
AD-621 780 FLD.2/5

•DA49 193MD2379
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF MEDICINE
AD-621 625 FLD.6/16

•DA49 193MD2556
CALIFORNIA UNIV LOS ANGELES DEPT OF SURGERY
A AD-621 709 FLD.6/5
CALIFORNIA UNIV BERKELEY
AD-621 838 FLD.6/5

•DA49 193MD2680 GRANT
GEORGE WASHINGTON UNIV WASHINGTON D C
AD-621 628 FLD.6/16
GEORGETOWN UNIV WASHINGTON D C
AD-622 144 FLD.6/16

•DRB5501 32
SASKATCHEWAN UNIV SASKATOON DEPT OF ELECTRICAL ENGINEERING
AD-621 904 FLD.9/1

•FA64WA5164
AIRBORNE INSTRUMENTS LAB DEER PARK N Y
(SRDS RD-65-37)
F AD-621 673 FLD.17/7

•NASA C76320
NAVAL RESEARCH LAB WASHINGTON D C
NRL 6233
F AD-622 190 FLD.20/13
NRL 6241
F AD-622 191 FLD.20/13
NRL 6246
F AD-622 227 FLD.20/13

•NASW1101
AVCO EVERETT RESEARCH LAB EVERETT MASS
AMP 166
AD-621 860 FLD.20

•NASW 11925
TEXAS INSTRUMENTS INC DALLAS SEMICONDUCTOR-COMPONENTS DIV
AD-622 031 FLD.9/1

•NGR09 002 028
CALIFORNIA INST OF TECH PASADENA
AD-621 653 FLD.9/1

•NIH AM06864 03
MARYLAND UNIV COLLEGE PARK INST FOR FLUID DYNAMICS AND APPLIED MATHEMATICS
TN BN 413
AD-621 848 FLD.6/16

•NIH HE07418
PHILADELPHIA GENERAL HOSPITAL PA DEPT OF PEDIATRICS
AD-622 157 FLD.6/5

•NIH NB5379 03
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
AD-621 633 FLD.6/16

•NIMH MSTIMH7084 05
HARVARD UNIV BOSTON MASS MEDICAL SCHOOL
TR 13
AD-621 973 FLD.9/10

•NOBSR 87542
WESTON INSTRUMENTS INC NEWARK N J
AD-621 762 FLD.9/1
AD-621 748 FLD.9/1

•NOBSR93140
TRACOR INC AUSTIN TEX
TRACOR 65 267 U
AD-622 085 FLD.17/9

•NOBSR93316
DUMONT ELECTRON TUBES CLIFTON N J
AD-621 754 FLD.9/1
AD-621 755 FLD.9/1

•NONR113403 GRANT
MEDICAL COLL OF VIRGINIA RICHMOND DEPT OF PSYCHIATRY
AD-621 902 FLD.6/16

•NONR114707
COLORADO UNIV BOULDER
TR 13
AD-621 974 FLD.9/10

•NONR114712
COLORADO UNIV BOULDER
AD-622 209 FLD.20/12

•NONR118111
DUKE UNIV DURHAM N C
TR 18
AD-622 252 FLD.9/10

•NONR120224
WISCONSIN UNIV MADISON
AD-621 843 FLD.9/3

•NONR122810
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
SRM 127
AD-622 250 FLD.9/1
SRM 122
AD-622 251 FLD.9/1

•NONR128602
OREGON STATE UNIV CORVALLIS
AD-621 996 FLD.8/10

•NONR128609
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
AD-621 993 FLD.8/10
AD-622 030 FLD.8/11

•NONR128610
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
DR 20
AD-621 717 FLD.8/11

•NONR128610 GRANT
OREGON STATE UNIV CORVALLIS DEPT OF OCEANOGRAPHY
AD-621 880 FLD.8/14

•NONR150906
IOWA UNIV IOWA CITY DEPT OF PHYSICS AND ASTRONOMY
AD-621 964 FLD.8/14

•NONR150906 GRANT

IOWA UNIV IOWA CITY DEPT
OF PHYSICS AND ASTRONOMY
AD-621 969 FLD.8/14

•NONR161103
IOWA UNIV IOWA CITY INST
OF HYDRAULIC RESEARCH
AD-621 760 FLD.20/4

•NONR161105
IOWA UNIV IOWA CITY INST
OF HYDRAULIC RESEARCH
AD-621 740 FLD.20/4

•NONR184110
MASSACHUSETTS INST OF TECH
CAMBRIDGE LAB FOR INSULATION
RESEARCH
TR 209
F AD-622 090 FLD.20/12

•NONR189819 GRANT
PRINCETON UNIV N J DEPT
OF PSYCHOLOGY
AD-621 639 FLD.5/10

•NONR189819
PRINCETON UNIV N J BEHAVIORAL
SYSTEMS LAB
TR 7
AD-621 763 FLD.5/10
TR 8
AD-621 764 FLD.5/10
TR 6
AD-621 889 FLD.5/10

•NONR189830
PALMER PHYSICAL LAB PRINCETON
UNIV N J
AD-621 723 FLD.5/1

•NONR186610
HARVARD UNIV CAMBRIDGE MASS
DIV OF ENGINEERING AND APPLIED
PHYSICS
HP 19
AD-621 897 FLD.20/12

•NONR186643 GRANT
HARVARD UNIV BOSTON MASS
MEDICAL SCHOOL
TR 13
AD-621 973 FLD.5/10

•NONR211904
TEXAS A AND M UNIV COLLEGE
STATION DEPT OF OCEANOGRAPHY
AND METEOROLOGY
REFERENCE 65 15T
AD-621 687 FLD.8/10
REFERENCE 65 25T
AD-621 788 FLD.8/10

•NONR21199
OREGON STATE UNIV CORVALLIS
DEPT OF OCEANOGRAPHY
AD-621 993 FLD.8/10

•NONR219600 GRANT
WOODS HOLE OCEANOGRAPHIC INSTI
TUTION MASS
REFERENCE 65 43
AD-621 938 FLD.4/2

•NONR22047
CALIFORNIA INST OF TECH PASADENA
AD-621 652 FLD.20/8
AD-621 693 FLD.5/1

•NONR221601
MARINE PHYSICAL LAB UNIV OF
CALIFORNIA SAN DIEGO
MPL U 91/64
AD-621 660 FLD.5/6

•NONR221605
MARINE PHYSICAL LAB UNIV OF
CALIFORNIA SAN DIEGO
MPL U 91/64
AD-621 660 FLD.5/6

•NONR221623

SCRIPPS INSTITUTION OF OCEANOGRAPHY
UNIV OF CALIFORNIA LA JOLLA
AD-622 264 FLD.8/10

•NONR221623 GRANT
SCRIPPS INSTITUTION OF OCEANOGRAPHY
UNIV OF CALIFORNIA LA JOLLA
AD-622 263 FLD.8/10

•NONR22960
STANFORD UNIV CALIF DEPT
OF MATERIALS SCIENCE
TR 10
AD-621 749 FLD.11/6

•NONR22973 GRANT
STANFORD UNIV CALIF INST
FOR MATHEMATICAL STUDIES
IN THE SOCIAL SCIENCES
TR 76
AD-622 248 FLD.5/10

•NONR22977
CALIFORNIA UNIV LOS ANGELES
WESTERN MANAGEMENT SCIENCE
INST
WORKING PAPER NO. 87
AD-621 688 FLD.5/9

•NONR24817
JOHNS HOPKINS UNIV BALTIMORE
MD SCHOOL OF HYGIENE AND
PUBLIC HEALTH
AD-621 645 FLD.6/16

•NONR277024
CARNEGIE INST OF TECH PITTSBURGH
PA GRADUATE SCHOOL OF INDUSTRIAL
ADMINISTRATION
(TT 69-64093)
AD-622 077 FLD.12/1

•NONR279100
TEMPLE UNIV PHILADELPHIA
PA DEPT OF MICROBIOLOGY
AD-621 928 FLD.6/1
AD-621 929 FLD.6/13

•NONR28957
GEOPHYSICAL SCIENCES LAB NEW
YORK UNIV N Y
65 8
AD-622 224 FLD.8/10

•NONR296401
SOUTH DAKOTA SCHOOL OF MINES
AND TECHNOLOGY RAPID CITY
AD-622 296 FLD.20/12
SOUTH DAKOTA SCHOOL OF MINES
AND TECHNOLOGY RAPID CITY
DEPT OF PHYSICS
TR 15
AD-621 709 FLD.20/12

•NONR299300
STANFORD RESEARCH INST MENLO
PARK CALIF
AD-622 103 FLD.5/10

•NONR310400
INDIANA UNIV BLOOMINGTON
DEPT OF CHEMISTRY
AD-621 966 FLD.6/1

•NONR329500
OLIN MATHIESON CHEMICAL CORP
NEW HAVEN CONN CHEMICALS
DIV
TR 27
AD-622 300 FLD.7/2

•NONR329600
THERM ADVANCED RESEARCH INC
ITHACA N Y
AD-621 855 FLD.20/4

•NONR340600
LITTLE (ARTHUR D) INC CAMBRIDGE
MASS
AD-622 049 FLD.15/5

•NONR350700

CALIFORNIA UNIV LOS ANGELES
DEPT OF ASTRONOMY
AD-621 695 FLD.3/1

•NONR365618
OPERATIONS RESEARCH CENTER
UNIV OF CALIF BERKELEY
ORC 65 30
AD-621 869 FLD.12/1

•NONR367800
HONEYWELL INC ST PAUL MINN
SYSTEMS AND RESEARCH DIV
1990 FR 1
F AD-621 706 FLD.13/10
1990 FR1
F AD-621 870 FLD.17/7

•NONR367900
STATE UNIV OF NEW YORK BINGHAMTON
F AD-621 988 FLD.5/10

•NONR372200
CENTER FOR NAVAL ANALYSES
WASHINGTON D C
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622 041	15/5
622 042	5/9
622 043	6/17
622 044	12/1
622 045	15/5
622 046	12/1
622 047	6/16
622 048	6/17
622 049	15/3
622 050	5/9
622 051	15/5
622 052	5/9
622 053	15/5
622 054	6/17
622 055	6/16
622 056	6/17
622 057	6/17
622 058	14/2
622 059	5/9
622 060	5/9
622 061	6/17
622 062	1/2
622 063	6/17
622 064	1/3
622 065	5/9
622 066	6/17
622 067	5/9
622 068	20/12
622 069	17/2.1
622 070	12/1
622 071	11/7
622 072	20/14
622 073	9/2
622 074	15/5
622 075	15/5
622 076	12/1
622 077	12/1
622 078	15/5
622 079	12/1
622 080	15/5
622 081	12/1
622 082	15/9
622 083	3/1
622 084	11/7
622 085	17/9
622 086	12/1
622 087	6/8
622 088	20/3
622 089	9/1
622 090	20/12
622 091	20/12
622 092	9/2
622 093	20/3
622 094	9/1
622 095	13/2
622 096	18/3
622 097	20/4
622 098	11/3
622 099	15/3
622 100	20/6
622 101	13/10
622 102	20/6
622 103	5/10
622 104	8/7
622 105	3/1
622 106	9/1
622 107	12/1
622 108	15/3
622 109	9/1
622 110	9/2
622 111	15/3
622 112	5/1
622 113	15/3
622 114	9/1
622 115	15/7
622 116	11/3
622 117	17/2
622 118	11/7
622 119	4/2
622 120	20/4
622 121	9/1
622 122	6/15
622 123	20/3
622 124	20/3
622 125	7/9
622 126	7/9
622 127	5/10
622 128	6/13
622 129	6/13
622 130	6/12
622 131	7/3
622 132	6/13
622 133	20/8
622 134	7/2
622 135	6/1
622 136	7/3
622 137	6/13
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622 139	5/10
622 140	7/9
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622 150	20/12
622 151	20/4
622 152	1/5
622 153	6/16
622 154	6/16
622 155	5/10
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622 157	6/5
622 158	6/16
622 159	6/16
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622 161	6/16
622 162	5/10
622 163	6/16
622 164	6/16
622 165	14/2
622 166	6/16
622 167	5/9
622 168	5/9
622 169	5/9
622 170	5/9
622 171	5/9
622 172	5/9
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622 190	20/13
622 191	20/13
622 192	8/6
622 193	8/6
622 194	16
622 195	19/4
622 196	20/12
622 197	6/17
622 198	17/2
622 199	15/5
622 200	20/8
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622 202	5/1
622 203	9/1
622 204	9/1
622 205	1/3
622 206	9/1
622 207	9/5
622 208	5/10
622 209	20/12
622 210	6/3
622 211	6/5
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622 213	4/2
622 214	5/9
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622 221	20/14
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622 230	20/10
622 231	5/10
622 232	20/3
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622 247	1/4
622 248	5/10
622 249	11/6
622 250	5/1
622 251	5/1
622 252	5/10
622 253	5/10
622 254	6/16
622 255	6/16
622 256	9/1
622 257	12/1
622 258	20/8
622 259	8/10

622 260	8/10
622 261	20/8
622 262	6/16
622 263	8/10
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622 265	11/6
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622 268	20/6
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622 270	9/5
622 271	20/3
622 272	20/8
622 273	6/16
622 274	12/1
622 275	7/2
622 276	20/8
622 277	20/3
622 278	21/9.2
622 279	7/3
622 280	11/6
622 281	19/4
622 282	14/3
622 283	20/6
622 284	9/2
622 285	5/10
622 286	13/2
622 287	20/2
622 288	20/12
622 289	20/12
622 290	14/2
622 291	1/2
622 292	13/2
622 293	5/9
622 294	5/9
622 295	5/9
622 296	5/9
622 297	5/9
622 298	5/10
622 300	7/2

OTHER RESEARCH REPORTS AND RELATED MATERIAL

REPORTS RELEASED BY AEC, NASA, DEPARTMENT OF COMMERCE, OTHER CIVILIAN AGENCIES, AND ALSO CERTAIN OLDER MILITARY REPORTS

*Descriptors marked with an asterisk are included in the subject index

01. Aeronautics

AD-287 225 Field 1C
CFSTI Price: HC$3.00

United States Rubber Co., Detroit, Mich.
DEVELOPMENT OF HIGH TEMPERATURE DESIGN CRITERIA FOR AIRCRAFT TIRES.
Technical documentary rept.
Jul 62, 71p
Contract AF33 616 5711, Proj. 1369, Task 136903
ASD TDR-62-43
Unclassified report

Descriptors: (*Aircraft tires, High-temperature research), Design, Reinforcing materials, Cables(Mechanical), Steel, Elastomers, Silicone plastics, Adhesion, Performance(Engineering), Tests.

Aircraft tires were constructed using radial steel plies constrained with circumferentially wound breakers and utilizing silicone as the elastomer. The tires were capable of performing at 200 mph after undergoing soaks at 350F. Dynamic tests were conducted after soaks up to 450F. Static hydroburst testing was conducted up to 513F. The current limiting factor in the tire design is adhesion of the silicone to the wire cables of the breaker. Liner extrusion, sidewall cracking, and bead chafing which had been deficiencies of the silicone-steel tire in the past have been resolved. Although the primary elastomers studied were the high temperature Siloxane polymers, a cursory investigation of other polymers with attractive high temperature characteristics was conducted. A high temperature test wheel suitable for brake testing was supplied to ASD. (Author)

AD-444 089 Field 1A
CFSTI Prices: HC$2.00

General Dynamics/Astronautics, San Diego, Calif.
THE BEHAVIOR OF THE MACH DISC UP TO MODERATE PRESSURE RATIOS,
by L. D. D'Attorre and F. Harshbarger. Jul 64,
29p Rept. no. GDA-DBE-64-042
Contract AF19 628 3269, ARPA Order 363, amend. 3
N65 15082
Unclassified report

Descriptors: (*Axially symmetric flow, Supersonic flow), Shock waves, Subsonic flow, Bell nozzles, Conical nozzles, Pressure.

Experimental measurements of the size and position of the Mach disc are summarized and compared with predictions. Only the technique of Bowyer, D'Attorre, and Yoshihara adequately predicts the experimental results obtained for a quiescent as well as a flowing ambient, hot and cold flow, and conical and bell-shaped nozzles over a range of exit to ambient static pressure ratios up to 300. Figures are given for predicting the size and position of the Mach disc for nozzles with axial flow, an exit Mach number of 3.185, a gamma = 1.225, and an ambient gamma = 1.4 as a function of exit to ambient pressure ratios and over a range of ambient Mach numbers. Also the inviscid flow fields including the Mach disc are provided for a limited number of conditions. (Author)

AD-445 949 Field 1C, 11C, 16D
CFSTI Prices: HC$2.00

Naval Ordnance Test Station, China Lake, Calif.
DEVELOPMENT OF AIRCRAFT PROTECTIVE COATING AGAINST ROCKET MOTOR EXHAUSTS,
by Roland E. Baker and John G. Badenhope.
Jun 64, 33p Rept. no. NOTS-TP-3443
Task RM3714 001/216 1W021B0 004
NAVWEPS 8479
Unclassified report

Descriptors: (*Coatings, Guided missile launchers), (*Aircraft finishes, Protective treatments), (*Exhaust gases, Erosion), (*Guided missile launchers, Aircraft), Fighters, Guided missile launchers, Guided missiles-(Air-to-air), Rubber coatings, Silicone plastics, Glass textiles, Plastic coatings, Stainless steel, Firing tests-(Ordnance).

This report describes the development of an aircraft protective coating against rocket-motor exhausts. Tests using the Mk 31 Mod 0 Sidewinder motor indicated that a coating with Q-3-0121 (Dow Corning) silicone rubber provided adequate protection for aircraft surfaces. This coating is eroded at the rate of 0.010 to 0.015 inch on the leading edge of the wing droop when a Mk 31 Mod 0 rocket motor is fired from the upper starboard launcher of the F-8D or F-8E aircraft at high altitude and low speed. No erosion could be detected during low-altitude or on high-speed firings.

AD-447 717 Field 1B, 20A
CFSTI Prices: HC$1.00

Supersonic Transport Development, Federal Aviation Agency, Washington, D. C.
SONIC BOOM BIBLIOGRAPHY,
comp. by Robert K. Friedman. Sep 64, 21p
Unclassified report

Descriptors: (*Sonic boom, Bibliographies), (*Bibliographies, Sonic boom), Urban areas, Attitudes, Supersonic flight, Transport planes.

The bibliography on sonic boom has been compiled in response to a specific request. No claim is made that these 193 citations comprise an exhaustive or critical compilation. The inclusion of any reference to material is not to be construed as an endorsement of the information contained in that material. The reference search was completed August 28, 1964. (Author)

N65-20814 Field 1D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Edwards, Calif. Flight Research Center.

CURRENT RESEARCH ON ADVANCED COCKPIT DISPLAY SYSTEMS,
by Roger L. Winblade. 1964, 25p NASA-TM-X-56010
Unclassified report

Presented at the Flight Mechanics Panel Meeting of the Advisory Group for Aeronautical Research and Development (25th), Munich (Germany) on 12-14 Oct 64.

Descriptors: (*Cockpits, Display systems), (*Display systems, Cockpits).

N65-21456 Field 1D
CFSTI Prices: HC$6.00 MF$1.50

Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
INVESTIGATION OF OPTIMIZATION OF ATTITUDE CONTROL SYSTEMS, VOLUME I,
by R. Sridhar, G. C. Agarwal, R. M. Burns, D. M. Detchmendy, and E. H. Kopf, Jr. Jan 65, 270p TR-EE-65-3
Contracts NAS7-100, JPL-950670
NASA CR-62195
Unclassified report

Descriptors: (*Attitude control systems, Optimization), (*Optimization, Attitude control systems).

N65-22565 Field 1A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
RECENT EXPERIMENTS IN HYPERSONIC TURBULENT BOUNDARY LAYERS,
by Mitchel H. Bertram and Luther Neal, Jr. 1965, 48p NASA-TM-X-56335
Unclassified report

Presented at the AGARD Specialists Meeting on Recent Develop. in Boundary-Layer Res., Naples, 10-14 May 1965; sponsored by Fluid Dyn. Panel of AGARD.

Descriptors: (*Turbulent boundary layer, Hypersonic flow), (*Hypersonic flow, Turbulent boundary layer).

N65-22633 Field 1C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland Ohio. Lewis Research Center.
INVESTIGATION OF INLET CONTROL PARAMETERS FOR AN EXTERNAL-INTERNAL-COMPRESSION INLET FROM MACH 2.1 TO 3.0,
by Bernhard H. Anderson and David M. Bowditch.
23 Sep 58, 19p NACA-RM-E58G08
Unclassified report

Descriptors: (*Jet engine inlets, Control systems).

N65-23041 Field 1C
CFSTI Prices: HC$5.00 MF$1.25

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
AERODYNAMIC PRINCIPLES FOR THE DESIGN OF JET-ENGINE INDUCTION SYSTEMS,
by Wallace F. Davis and Richard Scherrer. 27 Feb 56, 188p NACA-RM-A55F16
Unclassified report

Descriptors: (*Jet engine inlets, Aerodynamic characteristics).

N65-23331 Field 1C
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
PERFORMANCE OF AN ISENTROPIC, ALL-INTERNAL-CONTRACTION, AXISYMMETRIC INLET DESIGNED FOR MACH 2.50,
by David N. Bowditch and Bernhard H. Anderson.
15 Sep 58, 28p NACA-RM-E58E16
Unclassified report

Descriptors: (*Engine air systems components, Aerodynamic characteristics).

N65-23335 Field 1C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
PERFORMANCE OF MULTIPLE JET-EXIT INSTALLATIONS,
by John M. Swihart and William J. Nelson. 7 Jul 58, 14p NACA-RM-L58E01
Unclassified report

Descriptors: (*Supersonic planes, Aerodynamic configurations).

N65-23689 Field 1A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
AERODYNAMIC FORCE AND MOMENT CHARACTERISTICS OF SPHERES AND CONES AT MACH 7.0 IN METHANE-AIR COMBUSTION PRODUCTS,
by L. Roane Hunt. May 1965, 28p NASA-TN-D-2801
Unclassified report

Descriptors: (*Spheres, Aerodynamic characteristics), (*Conical bodies, Aerodynamic characteristics).

N65-23826 Field 1C
CFSTI Prices: HC$4.00 MF$1.00

National Aeronautics and Space Administration, Moffett Field, Calif.
LARGE-SCALE WIND-TUNNEL INVESTIGATION OF THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF A SUPERSONIC TRANSPORT MODEL HAVING VARIABLE-SWEEP WINGS,
by Anthony M. Cook, Richard K. Greif, and Kiyoshi Aoyagi. May 65, 126p NASA-TN-D-2824
Unclassified report

Descriptors: (*Supersonic planes, Aerodynamic characteristics), (*Transport planes, Aerodynamic characteristics).

N65-23920 Field 1A, 1C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration. Edwards, Calif. Flight Research Center.
AERODYNAMIC FORCES ON COMPONENTS OF THE X-15 AIRPLANE,
by Earl R. Keener and Chris Pembo. Mar 62, 12p NASA-TM-X-712
Unclassified report

Descriptors: (*Aerospace planes, Aerodynamic configurations).

N65-23926 Field 1A
CFSTI Prices: HC$4.00 MF$1.00

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
HEAT-TRANSFER MEASUREMENTS OF A 0.0667-SCALE MODEL OF THE X-15 AIRPLANE FOR AN ANGLE-OF-ATTACK RANGE OF 0 DEG TO 28 DEG AT MACH NUMBERS OF 2.88 AND 4.65,
by Earl A. Price, Jr., Nancy L. Taylor, and Paige B. Burbank. Jun 63, 142p NASA-TM-X-821
Unclassified report

Descriptors: (*Research planes, Aerodynamic heating), (*Heat transfer, Aerodynamic heating).

N65-26258 Field 1A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Houston, Tex. Manned Spacecraft Center.
RELATIONSHIP BETWEEN THE AERODYNAMIC DAMPING DERIVATIVES MEASURED AS A FUNCTION OF INSTANTANEOUS ANGULAR DISPLACEMENT AND THE AERODYNAMIC DAMPING DERIVATIVES MEASURED AS A FUNCTION OF OSCILLATION AMPLITUDE,
by Bass Redd, Dennis M. Olsen, and Richard L. Barton. Jun 65, 16p NASA-TN-D-2855
Unclassified report

Descriptors: (*Aerodynamic characteristics, Damping), (*Damping, Aerodynamic characteristics).

N65-26649 Field 1A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EXPERIMENTAL INVESTIGATION OF BLAST LOADING ON AN AIRFOIL IN MACH 0.7 AIRFLOW WITH INITIAL ANGLE-OF-ATTACK CHANGE OF 28 DEGREES,
by James C. Manning. Jun 65, 25p
NASA-TN-D-2876
Unclassified report

Descriptors: (*Airfoils, Aerodynamic loading), (*Blast, Aerodynamic loading).

N65-27816 Field 1A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
LOCAL TURBULENT SKIN-FRICTION MEASUREMENTS ON A FLAT PLATE AT MACH NUMBERS FROM 2.5 TO 4.5 AND REYNOLDS NUMBERS UP TO 69 X 1,000,000. Technical note,
by William J. Monta and Jerry M. Allen.
Jul 65, 16p NASA-TN-D-2896
Unclassified report

Descriptors: (*Turbulence, Friction), (*Flat plate models, Friction).

N65-27817 Field 1A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
FLUTTER INVESTIGATION OF STREAMWISE-ORIENTED ARRAYS OF CURVED PANELS UNDER COMPRESSIVE LOADING AND AERODYNAMIC HEATING,
by Robert W. Walker, Richard Rosecrans, and William D. Deveikis. Jul 65, 29p NASA-TN-D-2910
Unclassified report

Descriptors: (*Panels(Structural), Flutter), (*Flutter, Panels(Structural)).

N65-27945 Field 1D, 1C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Edwards, Calif. Flight Research Center.
FLIGHT EVALUATION OF THE X-15 BALL-NOSE FLOW-DIRECTION SENSOR AS AN AIR-DATA SYSTEM,
by John P. Cary and Earl R. Keener. Jul 65, 19p
NASA-TN-D-2923
Unclassified report

Descriptors: (*Aerospace planes, Flight instruments), (*Flight instruments, Aerospace planes).

N65-28627 Field 1A
CFSTI Prices: HC$1.00 MF$1.00

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
CHARTS FOR EQUILIBRIUM AND FROZEN FLOWS ACROSS PLANE SHOCK WAVES IN CARBON DIOXIDE,
by Craig D. Simcox and Victor L. Peterson.
1965, 129p NASA-SP-3018
Unclassified report

Descriptors: (*Shock waves, Frozen equilibrium flow), (*Carbon dioxide, Shock waves).

N65-28634 Field 1C
CFSTI Prices: HC$4.00 MF$0.75

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EXPERIMENTAL STUDY OF WIND-TUNNEL WALL EFFECTS AND WALL CORRECTIONS FOR A GENERAL-RESEARCH V/STOL TILT-WING MODEL WITH FLAP,
by Kalman J. Grunwald. Jul 65, 112p
NASA-TN-D-2887
Unclassified report

Descriptors: (*Tilt wings, Aerodynamic characteristics), (*Short take-off planes, Aerodynamic characteristics).

N65-28636 Field 1A
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EFFECT OF NOSE BLUNTNESS AND CONTROLLED ROUGHNESS ON THE FLOW ON TWO HYPERSONIC INLET CENTER BODIES WITHOUT COWLING AT MACH 5.98,
by James M. Cubbage. Jul 65, 62p
NASA-TN-D-2900
Unclassified report

Descriptors: (*Engine air systems components, Hypersonic characteristics), (*Hypersonic characteristics, Engine air systems components).

N65-28638 Field 1C
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EFFECTS OF ASPECT RATIO AND CANOPY SHAPE ON LOW-SPEED AERODYNAMIC CHARACTERISTICS OF 50.0 DEGREE SWEPT PARAWINGS,
by Frank M. Bugg. Jul 65, 42p NASA-TN-D-2922
Unclassified report

Descriptors: (*Parawings, Aerodynamic characteristics).

N65-28804 Field 1C
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EFFECTS OF WING DIHEDRAL AND PLANFORM ON STABILITY CHARACTERISTICS OF A RESEARCH MODEL AT MACH NUMBERS FROM 1.80 TO 4.63,
by Maurice O. Feryn and James F. Campbell.
Jul 65, 58p NASA-TN-D-2914
Unclassified report

Descriptors: (*Wings, Stability), (*Aerodynamic characteristics, Wings).

Patent 3,201,748 Field 1D

SYMBOL GENERATOR CIRCUIT FOR AIRCRAFT.
Patent assigned to Navy,
by George H. Balding. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Circuits, Display systems), (*Aircraft equipment, Circuits), Pulse generators, Patents.

The circuit is for use on high speed aircraft having a display system for pilot use such as is disclosed in patent No. 3,118,128. The electronic symbol generator is designed for the generation of a release marker symbol (time-to-go symbol) of cross-shaped or plus sign configuration for display on a television type screen similar to that disclosed in patent No. 3,118,128.

Patent 3,202,385 Field 1C, 11A

SEAL FOR HIGH DIFFERENTIAL PRESSURES.
Patent assigned to Army,
by Norman J. Waecker, Hugh D. MacDonald, Jr., and Francis J. Shaffling. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Metal seals, Exhaust nozzles), Patents, Ejection seats, Aluminum alloys, Pressures, Hemispherical shells.

The seal is for a rocket nozzle which forms part of the injection seat apparatus used in aircraft. The seal is made of an aluminum alloy and is in the form of a cup having a base of hemispherical shape. The structure provides increased safety to the remaining occupants and the plane form which a seat is ejected.

PB-168 174 Field 1C, 4B, 11I
CFSTI Prices: HC$7.00 MF$1.75

Minnesota Univ., Minneapolis. Dept. of Physics.

RESEARCH AND DEVELOPMENT IN THE FIELD OF HIGH ALTITUDE PLASTIC BALLOONS.
Progress rept. for 22 Dec 52-3 Dec 53.
3 Dec 53, 334p
Contract Nonr71001, Proj. NR211 002
AD 68 416
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Meteorological balloons, Design), (*Polyester plastics, Meteorological balloons), High altitude, Flight testing, Flight paths, Thermal radiation, Heating, Infrared radiation, Mathematical analysis.

Contents: Balloon design; Mylar balloon development program; Radiation heating of balloons; Analysis of balloon and air temperature meas.; Vertical flight.

PB-168 456 Field 1A, 20M
CFSTI Prices: HC$2.00 MF$0.50

Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
PROPERTIES OF HIGH TEMPERATURE ARGON BEHIND STRONG SHOCK WAVES MEASURED WITH A CAPACITIVE PROBE,
by R. D. Weymann. Oct 55, 27p
Technical note no. TN-BN-62
Contract AF18 600 993
AFOSR TN-57-774; AD 148 004
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Shock waves, Boundary layer), (*Argon, Thermal properties), Aerodynamic characteristics, Shock tubes, Ionization, Diffusion, Capacitance, Thickness.

A description is presented of a capacitive probe which is sensitive to the thickness of the boundary layer, when the gas in the undisturbed flow is ionized. This probe can be placed outside a shock tube, thus avoiding disturbances in the flow. Preliminary results for Ar at M between 6 and 10, and temperatures between 6000 and 9000 K show the usefulness of the probe for measuring the thickness of the boundary layer, the rate of ionization behind the shock front, and the coefficient of diffusion. (Author)

SC-DC-64-1595 Field 1A
CFSTI Prices: HC$4.00 MF$0.75

Oklahoma State Univ., Stillwater. School of Mechanical Engineering.
TRANSIENT BASE PRESSURE STUDY OF AN AXI-SYMMETRIC SUPERSONIC MISSILE FLYING HEAD-ON THROUGH A BLAST WAVE,
by Glen W. Zumwalt and Homer H. Tang.
Feb 64, 126p SBW-6
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Supersonic flight, Shock waves), (*Shock waves, Pressure).

02. Agriculture

AD-465 327 Field 2D, 6F, 4B
CFSTI Prices: HC$3.00

American Inst. of Crop Ecology, Silver Spring, Md.
SUGARBEET-CLIMATE RELATIONSHIPS AND THE USE OF PHENOLOGY IN ASCERTAINING THE TEMPERATURE REQUIREMENTS OF SUGARBEETS WITH SPECIAL REFERENCE TO THE INTERMOUNTAIN REGION OF THE UNITED STATES.
Feb 65, 88p
Contract DA18 064AMC127A
Unclassified report

Descriptors: (*Vegetables, Climatology), (*Climatology, Agriculture), (*Agriculture, Climatology), (*Ecology, Agriculture), Plants-(Botany), Metabolism, Temperature, Micrometeorology.

AD-465 328 Field 2D, 6F, 4B
CFSTI Prices: HC$2.00

American Inst. of Crop Ecology, Silver Spring, Md.
THE USE OF PHENOLOGY IN ASCERTAINING THE TEMPERATURE REQUIREMENTS OF PEANUTS WITH SPECIAL REFERENCE TO THE PEANUTS OF THE SOUTHEASTERN REGION OF THE UNITED STATES AND ITS LATITUDINAL AND THERMAL ANALOGUES IN OTHER COUNTRIES (TABULAR MATERIAL, PART I).
Apr 65, 39p
Contract DA18 064AMC127A
Unclassified report

See also AD-465 327.

Descriptors: (*Plants(Botany), Climatology), (*Climatology, Agriculture), (*Agriculture, Climatology), (*Ecology, Agriculture), Metabolism, Temperature, Micrometeorology.

AD-465 552 Field 2D, 6F, 4B
CFSTI Prices: HC$3.00

American Inst. of Crop Ecology, Silver Spring, Md.
THE USE OF PHENOLOGY IN ASCERTAINING THE TEMPERATURE REQUIREMENTS OF WHEAT WITH SPECIAL REFERENCE TO THE WHEAT OF THE NORTHERN GREAT PLAINS REGION OF THE UNITED STATES AND ITS LATITUDINAL AND THERMAL ANALOGUES IN OTHER COUNTRIES (TABULAR MATERIAL, PART I).
Apr 65, 70p
Contract DA18 064AMC127A
Unclassified report

See also AD-465 328.

Descriptors: (*Wheat, Climatology), (*Climatology, Agriculture), (*Agriculture, Climatology), (*Ecology, Agriculture), Plants(Botany), Metabolism, Temperature, Micrometeorology.

AD-465 553 Field 2D, 6F, 4B
CFSTI Prices: HC$7.00

American Inst. of Crop Ecology, Silver Spring, Md.
THE USE OF PHENOLOGY IN ASCERTAINING THE TEMPERATURE REQUIREMENTS OF WHEAT WITH SPECIAL REFERENCE TO THE WHEAT OF THE SOUTHEASTERN REGION OF THE UNITED STATES AND ITS LATITUDINAL AND THERMAL ANALOGUES IN OTHER COUNTRIES (TABULAR MATERIAL, PART I).
Apr 65, 316p
Contract DA18 064AMC127A
Unclassified report

Descriptors: (*Wheat, Climatology), (*Climatology, Wheat), Ecology), Agriculture, Meteorological parameters, Atmospheric temperature, Light, Periodic variations, Tables, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Japan, South Korea, China, Morocco, Australia, Israel, Greece, Cypress, Italy, Rural areas.

PB-168 453 Field 2D
CFSTI Prices: HC$1.00 MF$0.50

Weather Bureau, Washington, D. C.
BIOMETEOROLOGICAL FACTORS AS PREDICTORS OF AGRONOMIC MATURITY OF PEANUTS.
Technical note (Agricultural meteorology rept.), by V. J. Valli. Sep 65, 14p Rept. no. TN-6, AGMET-2
Unclassified report

Descriptors: (*Plants(Botany), Ecology), Agriculture, Meteorology, Growth, Photosynthesis, Temperature, Tables.

Five indices of plant growth and development were examined for ability to predict maturity of six varieties of peanuts. These indices were: (1) Growing Degree Days above a base of 65F; (2) Effective Heat Units with a lower cardinal temperature of 56F. and an optimum cardinal temperature of 76F.; (3) Effective Radiation (black bulb daily mean temperature times day length divided by ten); (4) Radiation in langleys; (5) Effective Langleys (langleys times the daily mean temperature). Of the five indices, based on the standard deviation in days and the coefficient of variation, the Effective Langleys index was the best single predictor of peanut maturity. Accumulations of Effective Langleys, from planting to maturity, varied between varieties as follows: Dixie Spanish: 39,700; Early Runner, Virginia Bunch 67, and Virginia Bunch G2: 47,000; Dixie Runner and Southeastern Runner 56-15: 50,000. (Author)

03. Astronomy and Astrophysics

N65-17995 Field 3A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
THE MARTIAN ENVIRONMENT,
by Robert B. Owen. 19 Nov 64, 42p
NASA-TM-X-53167
Unclassified report

Descriptors: (*Mars, Astronomy), Surface properties, Planetary atmospheres.

N65-21000 Field 3B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
THE SOLAR FLARE ENVIRONMENT,
by W. T. Roberts. 12 Mar 65, 38p NASA-TM-X-53216
Unclassified report

Descriptors: (*Solar flares, Solar atmosphere).

N65-21317 Field 3A, 8G, 22A
CFSTI Prices: HC$7.00 MF$1.75

National Aeronautics and Space Administration, CoCoa Beach, Fla. John F. Kennedy Space Center.
THE WORKING GROUP ON EXTRATERRESTRIAL RESOURCES, THIRD ANNUAL MEETING.
1964, 346p NASA-TM-X-56277
Unclassified report

Prepared for Meeting held at CoCoa Beach, Fla., 18-20 Nov 64.

Descriptors: (*Geology, Extraterrestial basis), (*Extraterrestrial topography, Symposia), (*Symposia, Extraterrestrial topography), Space biology, Lunar bases.

N65-21772 Field 3A
CFSTI Prices: HC$1.00 MF$0.50

California Univ., La Jolla.
IONIZED GAS IN THE NUCLEI OF ELLIPTICAL, SO, SPIRAL AND IRREGULAR GALAXIES,
by E. Margaret Burbidge and G. R. Burbidge.
Mar 65, 16p
Grant NsG357
NASA CR-62223
Unclassified report

Descriptors: (*Galaxies, Ions).

N65-21770 Field 3B, 8M
CFSTI Prices: HC$2.00 MF$0.50

Douglas Aircraft Co., Inc., Santa Monica, Calif., Missile and Space Systems Div.
EXPERIMENTAL INVESTIGATION OF ULTRA-HIGH VACUUM ADHESION AS RELATED TO THE LUNAR SURFACE.
Quarterly progress rept. no. 3, 1 Jan-31 Mar 65,
by J. A. Ryan. 31 Mar 65, 30p
Contract NAS7 307
NASA CR-62220
Unclassified report

Descriptors: (*Lunar environment, Vacuum), (*Silicates, Adhesion).

N65-23291 Field 3A, 17I, 8B
CFSTI Prices: HC$7.00 MF$1.75

Ling-Temco-Vought, Inc., Dallas, Tex. Military Electronics Div.
LUNAR CONTOUR MAPPING SYSTEM (LUCOM).
Final Report, 5 Aug. 1964-18 Mar. 1965,
by G. M. Goldberg, W. C. Hallmark, and R. H. Myers. 31 Mar 65, 354p Rept.-4-31200/5R-30
Contract NAS9-3269
NASA CR-65001
Unclassified report

Descriptors: (*Moon, Mapping), (*Mapping, Radar equipment).

N65-24115 Field 3B, 20F
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
THE SOLAR CONSTANT AND SPECTRAL DISTRIBUTION OF SOLAR RADIANT FLUX,
by Matthew P. Thekaekara. 1961, 46p
NASA-TM-X-51677
Unclassified report

Descriptors: (*Solar radiation, Spectra(Visible + ultraviolet)).

N65-24355 Field 3A, 22A
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
MARS ENVIRONMENTAL MEASUREMENTS IN SUPPORT OF FUTURE MANNED LANDING EXPEDITIONS,
by W. H. Krase. Apr 1965, 48p RM-4437-NASA
Contract NASr-21
NASA CR-62872
Unclassified report

Descriptors: (*Mars, Planetary atmospheres).

04. Atmospheric Sciences

N65-18958 Field 4B, 9F
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SWEDEN OPERATIONS - 1962,
by C. B. Tackett. Feb 65, 67p
NASA-TM-X-55174, X-371-65-96
Unclassified report

Descriptors: (*Atmospheric sounding, Sweden), (*Clouds, Sweden), (*Telemeter systems, Sounding rockets).

N65-23662 Field 4A
CFSTI Prices: HC$1.00 MF$0.50

Pennsylvania State Univ., University Park.
ELECTRON DENSITIES AND TEMPERATURES IN THE F-REGION FROM BACKSCATTER MEASUREMENTS AT ARECIBO,
by H. C. Carlson and J. S. Nisbet. 1965, 16p
Grant NsG-134
NASA CR-62663
Unclassified report

Descriptors: (*Atmospheric sounding, Electron density), (*Electron density, Atmospheric sounding).

N65-24306 Field 4A
CFSTI Prices: HC$2.00 MF$0.50

Southwest Center for Advanced Studies, Dallas, Tex.
THE MAINTENANCE OF THE NIGHTTIME F-LAYER,
by W. B. Hanson and T. N. L. Patterson. May 1964, 42p
Grant NsG-269-62
NASA CR-62868
Unclassified report

Descriptors: (*Ionosphere, Night sky), (*Night sky, Ionosphere).

Patent 3,200,397 Field 4B, 17I, 9E

CONSTANT HEIGHT ANTENNA SCAN.

Patent assigned to Air Force,
by Ralph J. Donaldson, Jr. 10 Aug 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Nutating antennas, Meteorological radar), (*Radar scanning, Nutating antennas), (*Clouds, Radar scanning), Radar antennas, Patents.

The apparatus is utilized to determine rain-producing potentialities of an observed storm or cloud mass. The scanning antenna is caused to partake of movement about more than one axis as it traverses its scanning cycle. This technique produces a multiplicity of informative echo pulses returning from points in the cloud mass that are all of constant height above the curving earth's surface, even though of diverse spacing both in azimuth and in range; so that in single rotational cycle of the antenna there is obtained, in one operation, a single level, cross-sectional type of panoramic report of the cloud mass characteristics, comparable to what has heretofore been obtainable only after correlating results reported in multiple, sequentially occurring, antenna scans.

PB-168 173 Field 4B, 9B
CFSTI Prices: HC$3.00 MF$0.75

Meteorology International, Inc., Monterey, Calif.
EVALUATION OF THE DIAGNOSTIC-CYCLE ROUTINE IN THE INTERPRETATION OF LAYER-CLOUD EVOLUTIONS.
Final rept.,
by Roland E. Nagle, James R. Clark, and Manfred M. Holl. 15 May 65, 97p
Contract Cwb10884, Proj. M118

Unclassified report

Descriptors: (*Programming(Computers), Meteorology), (*Cloud cover, Mathematical prediction), (*Meteorology, Programming(Computers)), Air mass analysis, Meteorological satellites, Pictures, Meteorological parameters, Clouds, Configuration, Distribution.

The Diagnostic-Cycle Routine is a collection of objectively-formulated, computer-programmed techniques which have been designed for the assimilation, inter-comparison and interpretation of interrelated meteorological observations including satellite videographs. From the inferred evolution of the mass-structure distribution, as evidenced by 12-hourly analyses, the horizontal velocity distribution for one or more isentropic surfaces is diagnosed. Using the horizontal velocity distribution as input, the Routine derives net horizontal and net vertical, parcel-displacements (in the synoptic range-of-scale) for specified regions and periods of time. This permits pattern configurations of layer-cloudiness to be remapped to later positions which are consistent with the concomitant mass-motion evolution. The Routine is applied to five separate cases, each of which encompasses a 24-hour period. The layer-cloudiness distributions for the initial and terminal times of each case are analyzed primarily from the TIROS operational nephanalysis. The results indicate that the major portion of layer-cloudiness distributions in extra-tropical latitudes can be accounted for by the time-integrated, horizontal and vertical parcel-displacements. The implications of these results to the objective use of satellite cloud data are discussed.

PB-168 259 Field 4B, 17B
CFSTI Prices: HC$4.00 MF$1.00

United Aircraft Corporate Systems Center,
Farmington, Conn. Weather System Center.
U. S. WEATHER BUREAU BROAD SYSTEM DESIGN AND ANALYSIS: CURRENT STATUS OF THE HEMISPHERIC EXCHANGE PROGRAM AND SELECTED FACSIMILE BROADCASTS.
31 May 65, 122p Rept. no. SCR-228
Contract Cwb11044

Unclassified report

Descriptors: (*Weather communications, Global communication systems), (*Global communication systems, Weather communications), (*Facsimile communication systems, Weather communications), Weather forecasting, Meteorological parameters, Data transmission systems, Radio communication systems, Systems engineering.

The purpose of this study was to examine certain areas of the current world weather system that have an impact on the design and analysis of the World Weather Watch. Specifically the areas are: (1) Determine traffic flow on the main Northern Hemisphere Exchange Trunk (New York, Offenbach, Moscow, New Delhi and Tokyo); (2) determine the capacity of the Northern Hemisphere Exchange Trunk; (3) identify radio facsimile transmission schedules of analyses and prognoses for Nairobi, Tokyo, Buenos Aires, Moscow, Suitland, Melbourne and Offenbach; and (4) determine the status of the Southern Hemisphere Exchange and Inter-Hemisphere Exchange Plans. This report reflects the current status of the hemispheric exchange trunk and the scheduled facsimile broadcasts from selected locations. (Author)

PB-168 326 Field 4A, 20N
CFSTI Prices: HC$3.00 MF$0.75

Pennsylvania State Univ., University Park. Ionosphere Research Lab.
GENERALIZATION OF THE D-REGION ELECTRON DENSITY SYNTHESIS TECHNIQUE.
Scientific rept.,
by K. H. Care. 1965, 72p
Rept. no. SR-248
Grant NSF GP846

Unclassified report

Descriptors: (*Electron density, Synthesis), (*Ionosphere, Electron density), Ionospheric propagation, Periodic variations, Radio waves, Numerical analysis.

The present work deals with the generalization of the technique of synthesizing the D-region electron density profiles based on the radio wave amplitude and phase interaction measurements. The technique was extended to include the generalized expression for the complex index of refraction, instead of the classical Appleton-Hartree equations, in both the amplitude and phase interaction equations. The classical synthesis technique and the generalized synthesis technique are compared using theoretical data and real data. The generalized synthesis technique is found to produce electron densities which are higher than those produced by the classical synthesis technique. Also, it was found that the generalized synthesis technique produces more reliable results when the interaction data are not available near the base of the ionosphere. Mean electron density profiles for the months of January, February and March, 1964, are presented together with the results showing diurnal and seasonal variations. (Author)

PB-168 335 Field 4B, 13B, 4A, 6F
CFSTI Prices: HC$2.00 MF$0.50

Weather Bureau, Washington, D. C. Air Resources Lab.
DISPERSION ESTIMATES FROM POLLUTANT RELEASES OF A FEW SECONDS TO 8 HOURS IN DURATION.

Technical note,
by David H. Slade. Aug 65, 28p Rept. no. WBTN-2-ARL-1
Unclassified report

Descriptors: (*Diffusion, Air pollution), (*Air pollution, Diffusion), (*Atmosphere, Transport properties), Wind, Atmospheric motion, Aerosols, Particles, Wastes(Industrial), Distribution, Meteorology, Public health.

The purpose of this note is to present a simple method, based on on-site measurements made with a single wind system, for estimating dosage or concentration values, from point sources of pollution at a specific location. The method is based on diffusion theory and experimental evidence. A number of readily rationalized simplifications have been used to develop this system of dispersion specification which is primarily intended for use in constructing dispersion climatologies. The method may be used at any location situated in reasonably regular terrain. It should be used with great care, if at all, in areas typified by large, discrete topographic variations such as marked valleys, mountain peaks, and coastal regions.

PB-168 355 Field 4B, 1B
CFSTI Prices: HC$3.00 MF$0.75

Stanford Research Inst., Menlo Park, Calif.
OBJECTIVE ANALYSIS AND FORECASTING OF CLEAR-AIR TURBULENCE.
Final rept.,
by R. M. Endlich and R. L. Mancuso. Jun 65, 61p
Contract Cwb10871, Proj. SRI5031
Unclassified report

Descriptors: (*Turbulence, Weather forecasting), (*Weather forecasting, Turbulence), (*All-weather aviation, Weather forecasting), Air mass analysis, Wind, Atomspheric temperature, Atmospheric sounding, Aircraft, Flight paths, Meteorological parameters, Correlation techniques.

This investigation is based on pilot reports of high-level turbulence for the special turbulence reporting period (Colson, D., 'Summary of High Level Turbulence Program for 4-9 February, 1963,' Presented at Fifth Conference in Applied Meteorology, Atlantic City, New Jersey (1964)) and upon standard meteorological data analyzed by computer. During this five-day period, a series of rather sharp upper-air troughs travelled across the United States, while jet streams were notably absent. Many of the regions reported as turbulent were associated in a general way with the troughs. In order to test and compare meteorological quantities as indicators of turbulence, a number of vertical derivatives of wind and temperature were computed from individual soundings. It was found that the vertical wind-shear vector was as good a single criterion as any; however, several other quantities (including Richardson's number and wind-direction shear) were nearly as effective. Grid-point analyses were made of vertical shear over 50-mb layers, and these analyses were found to be as accurate as station values in indicating turbulence. Also, grid-point analyses were made of horizontal wind components, stream function, vorticity, horizontal shear, and resultant deformation.

PB-168 367 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

Miami Univ., Coral Gables, Fla. Marine Lab.
STUDIES OF HURRICANE SPIRAL BANDS AS OBSERVED ON RADAR,
by H. V. Senn, H. W. Hiser, and R. C. Bourret.
Sep 57, 16p
NHRP 12
Unclassified report

Descriptors: (*Tropical cyclones, Meteorological parameters), (*Hurricane tracking, Air mass analysis), (*Meteorological radar, Hurricane tracking), (*Marine meteorology, Tropical cyclones), Vortices, Storms, Rainfall, Radar scanning, Radar echo areas.

A modified logarithmic spiral which provides for the limiting circle necessitated by the eye of a hurricane as well as theoretically circular storm construction is presented. This modified formula also accounts for varying crossing angles which may more truly represent the structure of hurricanes found at low latitudes than the original 'fixed crossing angle' spirals. These various formulas are compared and the original simple spirals prove to be more practical for operational use. Correlations between surface winds and the movements of radar spiral band elements for several storms show the relative unimportance of minor variations in surface terrain over which the storm passes and the comparatively low steering levels controlling the patterns these elements form. In addition, simple correlations between spiral band characteristics and other storm parameters are presented along with further evidence of pre-hurricane squall lines. A variety of arguments is presented to show that the radar rain band pattern reflects the wind flow in a layer centered near 2,500 feet. (Author)

PB-168 375 Field 4B
CFSTI Prices: HC$2.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge.
ON THE ENERGETICS OF THE MATURE HURRICANE AND OTHER ROTATING WIND SYSTEMS,
by Richard L. Pfeffer. Jul 58, 41p
Contract Cwb9009
NHRP 20
Unclassified report

Descriptors: (*Tropical cyclones, Air mass analysis), (*Air mass analysis, Tropical cyclones), (*Marine meteorology, Tropical cyclones), (*Hurricane tracking, Air mass analysis), Wind, Vortices, Energy, Dynamics.

The first part of this paper is devoted to the formulation and interpretation of the energy equations as they apply to the study of rotating wind systems of interest in meteorology. In a subsequent section the energy cycles of different rotating systems in the atmosphere are discussed. Finally, the roles of 'azimuthal-mean motions' and of 'horizontal-eddy processes' in the generation of azimuthal-mean kinetic energy in the mature hurricane are examined quantitatively from observational data. As expected, azimuthal-mean motions generate significant amounts of mean rotational kinetic energy within the hurricane. However, interactions with the surrounding atmosphere do not cause organized rotational kinetic energy of the hurricane to be dissipated into that of horizontal eddies, as might be expected. According to the observations, the reverse is the case; namely, that the hurricane circulation feeds on the energy of the horizontal eddies. (Author)

PB-168 376 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

National Hurricane Research Project, Weather Bureau, Washington, D. C.
FORMATION OF TROPICAL STORMS RELATED TO ANOMALIES OF THE LONG-PERIOD MEAN CIRCULATION,
by Emanuel M. Ballenzweig. Sep 58, 20p
Rept. no. NHRP-21
Unclassified report

Descriptors: (*Tropical cyclones, Air mass analysis), (*Air mass analysis, Tropical cyclones), (*Marine meteorology, Tropical cyclones), (*Weather forecasting,

Tropical cyclones), Hurricane tracking, Meteorological parameters, Atlantic Ocean, Meteorological charts, Storms.

By using composite charts of time-averaged means many details of the role of the large-scale circulation in influencing the generation of tropical cyclones are brought into focus. First, a contrast is shown between generally propitious and inhibiting conditions for genesis in the broad area of the North Atlantic. Next, the formation of tropical storms is shown to be concentrated in five areas in the Atlantic and the longer-period circulation features accompanying tropical cyclogenesis in these areas is discussed with the help of a series of charts containing rather clear-cut anomalous features. Conditions favorable for the formation of tropical storms are found to differ among the different areas. The composite charts appear to be useful as guides in the preparation of long-range forecasts of hurricane formation, once the mean circulation has been predicted. (Author)

PB-168 393 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

Florida State Univ., Tallahassee. Dept. of Meteorology.
MARKED CHANGES IN THE CHARACTERISTICS OF THE EYE OF INTENSE TYPHOONS BETWEEN THE DEEPENING AND FILLING STAGES,
by C. L. Jordan. May 61, 24p
Contracts Cwb9683, Cwb9873
NHRP R-44
Unclassified report

Descriptors: (*Tropical cyclones, Meteorological parameters), (*Hurricane tracking, Air mass analysis), (*Marine meteorology, Tropical cyclones), Aircraft, Flight paths, Storms, Thermodynamics, Moisture, Dynamics.

Aircraft reconnaissance observations from the eye of unusually deep typhoons (minimum sea level pressure < or = 900 mb.) indicate that temperature and moisture conditions in the layer between the surface and 700 mb. usually undergo rather large changes at about the time of lowest pressure. Abnormally warm, dry soundings are found almost exclusively during the period that the sea level pressure is falling rapidly. Following the time of lowest pressure, the soundings are quite moist in most instances and lapse rates are very close to the moist adiabatic rate. The size of the eye also shows systematic changes between the deepening and filling stages of the storm. The eye usually decreases in size as the storm deepens with the minimum value occurring near the time of lowest pressure. Cloud data for the eye indicate quite variable conditions and fail to show clear cut differences between the deepening and filling stages which might be expected from the observed changes in temperature and moisture within the eye. The temperature changes in the surface to 700-mb. layer offer a relatively small contribution to the observed changes in sea level pressure in tropical cyclones. Although observations are not available for the upper tropospheric portions of the eye, some qualitative statements can be made in regard to the temperature changes in the lower layer along with the changes in sea level pressure. (Author)

PB-168 394 Field 4B
CFSTI Prices: HC$2.00 MF$0.50

National Hurricane Research Project, Weather Bureau, Miami, Fla.
THE OCCURENCE OF ANOMALOUS WINDS AND THEIR SIGNIFICANCE,
by M. A. Alaka. 15 May 61, 29p Rept. no. NHRP-R-45
Unclassified report

Descriptors: (*Wind, Marine meteorology), (*Air mass analysis, Marine meteorology), (*Marine meteorology, Air mass analysis), Storms, Atmospheric motion, Meteorological parameters, Tropical cyclones.

Observational evidence is provided for the occurrence of anomalous winds which represent an anticyclonic rotation in space, and a mechanism for their development is suggested. The unstable nature of these winds and the role they play in the development of certain types of atmospheric disturbances is then discussed, and it is suggested that anomalous winds provide the dynamic mechanism for triggering hurricane formation and for the observed deepening of troughs downstream from intense pressure ridges. Finally it is noted that although the observational evidence presented is for the occurrence of anomalous winds over small regions of the atmosphere, their development is dependent on large-scale processes and their effect extends beyond the area where they occur. (Author)

PB-168 395 Field 4B
CFSTI Prices: HC$3.00 MF$0.75

Colorado State Univ., Fort Collins.
SOME ASPECTS OF HURRICANE DAISY, 1958. Revised ed.,
by Herbert Riehl and Joanne Malkus. 22 May 61, 66p
NHRP R-46
Unclassified report
Prepared in cooperation with Woods Hole Oceanographic Institution, Mass. Revision of manuscript submitted 17 Apr 61.

Descriptors: (*Tropical cyclones, Meteorological parameters), (*Hurricane tracking, Air mass analysis), (*Marine meteorology, Tropical cyclones), West Indies, Aircraft, Flight paths, Storms, Thermodynamics, Moisture, Dynamics, Velocity.

Observations from research flight missions into hurricane Daisy (1958) are utilized to compute the budgets of heat, moisture, kinetic energy, and momentum. Calculations are performed for a period when the cyclone was just becoming a hurricane, and for a second period, two days later when it had attained maturity.

PB-168 396 Field 4B
CFSTI Prices: HC$2.00 MF$0.50

National Hurricane Research Project, Weather Bureau, Miami, Fla.
CONCERNING THE MECHANICS AND THERMODYNAMICS OF THE INFLOW LAYER OF THE MATURE HURRICANE,
by Stanley L. Rosenthal. Sep 61, 35p Unclassified report
Rept. no. HNRP-R-47
Descriptors: (*Tropical cyclones, Meteorological parameters), (*Hurricane tracking, Air mass analysis), (*Marine meteorology, Tropical cyclones), Mathematical models, Atmospheric motion, Thermodynamics, Dynamics.

The Malkus-Riehl model of the hurricane inflow layer is extended to include vertical variations of radial velocity and density. The tangential equation of motion is solved to obtain radial distributions of tangential wind for certain specified inflow angles. The radial wind component is then obtained from the tangential wind and the inflow angle. The pressure profile is obtained from the radial equation of motion. The thermodynamic constraints implied by these velocity and pressure fields are examined in relation to the vertical wind shear and the static stability. The diabatic heating and the various energy transformations needed to sustain the velocity and pressure fields are computed. The results appear to be quite reasonable. (Author)

PB-168 397 Field 4B
CFSTI Prices: HC$4.00 MF$0.75

National Hurricane Research Project, Weather Bureau, Miami, Fla.
ON THE STRUCTURE OF HURRICANE DAISY (1958). Revised ed.,
by Jose A. Colon. 8 Sep 61, 107p
Rept. no. NHRP-R-48
Unclassified report

Revision of manuscript submitted 4 Aug 61. See also PB-168 395.

Descriptors: (*Tropical cyclones, Meteorological parameters), (*Hurricane tracking, Air mass analysis), (*Marine meteorology, Tropical cyclones), West Indies, Aircraft, Flight paths, Storms, Thermodyanmics, Dynamics, Meteorological charts.

During the 4-day period August 25 to August 28, 1958, aircraft flew a total of eight research missions into hurricane Daisy at levels ranging from 960 to 240 mb. Fairly complete data showing the 3-dimensional structure of the hurricane at two stages in its life cycle were obtained. The structure of hurricane Daisy is described in this report and the data are amply illustrated in the form of profiles. The general characteristics of the winds, temperature, dew point, and cloud and precipitation fields are discussed, including the nature of the fluctuations of these parameters in the hurricane area and how the temperature and wind observations are affected by cloud formation and precipitation along the path of the aircraft.

PB-168 399 Field 4B
CFSTI Prices: HC$6.00 MF$1.50

National Hurricane Research Project, Weather Bureau, Miami, Fla.
PROCEEDINGS OF THE TECHNICAL CONFERENCE ON HURRICANES (2nd), 27-30 JUN 61, MIAMI BEACH, FLA, PART I,
ed. by M. A. Alaka. Mar 62, 275p
Rept. no. NHRP-R-50, pt. 1
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Tropical cyclones, Symposia), (*Marine meteorology, Tropical cyclones), (*Hurricane tracking, Symposia), Storms, Meteorological parameters, Air mass analysis, Meteorological radar, Meteorological satellites, Thermodynamics, Dynamics, Mathematical prediction, Weather stations, Instrumentation.

New detailed observations being gathered in hurricanes by aircraft are presented. Topics include: Radar analysis of tropical cyclones, observing-tracking systems and facilities, and storm surges.

PB-168 400 Field 4B
CFSTI Prices: HC$4.00 MF$1.00

National Hurricane Research Project, Weather Bureau, Miami, Fla.
PROCEEDINGS OF THE TECHNICAL CONFERENCE ON HURRICANES (2nd), 27-30 JUNE 61, MIAMI BEACH, FLA, PART II,
ed. by M. A. Alaka. Mar 62, 148p
Rept. no. NHRP-R-50, pt. 2
Unclassified report

Available copy will not permit fully legible reproduction. See also PB-168 399.

Descriptors: (*Tropical cyclones, Symposia), (*Marine meteorology, Tropical cyclones), (*Hurricane tracking, Symposia), Storms, Air mass analysis, Energy, Thermodynamics, Meteorological parameters, Mathematical prediction.

Topics include: Formation of hurricanes, energy cycles and models, circulation and energy processes in the storm core, and prediction of hurricane movement.

PB-168 401 Field 4B
CFSTI Prices: HC$7.00 MF$1.75

National Hurricane Research Project, Weather Bureau, Miami, Fla.
INVENTORY, USE, AND AVAILABILITY OF NATIONAL RESEARCH PROJECT METEOROLOGICAL DATA GATHERED BY AIRCRAFT,
by H. F. Hawkins, F. E. Christensen, and S. C. Pearce. Apr 62, 359p Rept. no. NHRP-R-52
Unclassified report

Descriptors: (*Tropical cyclones, Meteorological parameters), (*Hurricane tracking, Aircraft), (*Aircraft, Hurricane tracking), (*Meteorological instruments, Hurricane tracking), Storms, Data processing systems, Weather forecasting.

This paper has been primarily designed to satisfy the following requirements: (1) To make known to meteorological researchers the area, date, and time over which National Hurricane Research Project aircraft have gathered meteorological information. In addition, information is provided as to: flight altitudes, sampling rates, and parameters available on each particular flight. Furthermore, the form in which the data are available is similarly indicated on the inventory listing. In connection with storm or hurricane flights, further information is displayed as to the positioning of the data relative to the moving storm center. (2) To discuss the instrumentation as it relates to: operating principles, calibration, characteristics, accuracy and post-flight calibration. (3) To indicate uses of the data. The section on data reduction explains in detail the exact processing to which the raw data have been subjected in order to ready them for meteorological usage. It outlines the formulae used in data reduction and the format in which the data are presented on the machine print-out.

PB-168 402 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

National Hurricane Research Project, Weather Bureau, Miami, Fla.
ON THE MOMENTUM AND ENERGY BALANCE OF HURRICANE HELENE (1958). Revised ed.,
by Banner I. Miller. Sep 61, 23p
Rept. no. NHRP-R-53
Unclassified report

Revision of manuscript submitted 8 Aug 61.

Descriptors: (*Tropical cyclones, Meteorological parameters), (*Hurricane tracking, Air mass analysis), (*Marine meteorology, Tropical cyclones), Weather stations, Aircraft, Ships, Storms, Energy, Velocity, Thermodynamics.

Using flight data supplemented by surface ship observations, the vertical fluxes of angular momentum, kinetic energy, sensible and latent heat are calculated for hurricane Helene (1958). These computations are used to estimate the surface exchange coefficients at various radii. Although the accuracy of the data makes the results

questionable, it is found that the coefficient for heat and moisture exchange is about 1.3 times that for angular momentum. From the kinetic energy budget, internal frictional dissipation is obtained as a residual. In the wall cloud region it is found that internal friction exceeds the ground friction, but that elsewhere in the cyclone the two are about equal. The importance of internal friction in determining the heat balance is discussed briefly. (Author)

PB-168 403 Field 4B
CFSTI Prices: HC$3.00 MF$0.75

Colorado State Univ., Fort Collins.
ON THE BALANCE OF FORCES AND RADIAL ACCELERATIONS IN HURRICANES,
by William M. Gray. May 62, 76p
NHRP R-54

Unclassified report

Descriptors: (*Tropical cyclones, Meteorological parameters), (*Hurricane tracking, Air mass analysis), (*Marine meteorology, Tropical cyclones), (*Meteorological instruments, Hurricane tracking), Vortices, Dynamics, Aircraft, Flight paths, Doppler navigation.

Hurricanes have often been described as vortices in which the cyclostrophic wind equation should be valid in the core of maximum winds and the gradient wind equation in the periphery. But the degree to which these equations really describe the balance of forces has not been determined. This has been due to lack of reliable wind and pressure-height information. With the installation of the National Hurricane Research Project of the United States Weather Bureau in 1956, and with technical development of the gyronavigation system and other instruments, these observational inadequacies have been reduced to some extent overcome. The Doppler navigation system has given for the first time accurate wind data over ocean areas. Within the limits of accuracy of observations, the question concerning the form of the laws of motion applicable in hurricanes can now be answered in certain respects for several storms which were thoroughly covered by research missions of the National Hurricane Research Project. This paper presents a first attempt to take up some special aspects of the balance of forces computed from the flight data. Computations are made for Atlantic hurricanes Carrie (1957), Cleo (1958), Daisy (1958), and Helene (1958). (Author)

PB-168 422 Field 4B, 4A
CFSTI Prices: HC$3.00 MF$0.75

Weather Group (4th), Kansas City, Mo. Detachment 4.
PROJECT TORNADO-SFERICS, PHASE 1960.
Final rept.
1960, 83p Rept. no. 4WGP-105-2-7
AD 254 827

Unclassified report

Descriptors: (*Atmospherics, Storms), (*Storms, Atmospherics), (*Weather forecasting, Storms), Tornadoes, Thunderstorms, Atmospheric electricity, Correlation techniques, Meteorology.

Results of the 1960 Project Tornado-Sferics are presented. The AN/FMS-3 sferics equipment was operated for the first full severe weather season. Descriptions of the equipment and methods of operation and calibration are presented. Analyses to illustrate the effectiveness of the system in detecting weather phenomena are discussed. Case studies are presented to show the correlation of sferics fixes as detected by the system with severe weather activity. It is concluded that fixes from azimuths of four or more detection stations are reliable indicators of thunderstorm activity, but not all thunderstorms are detected by the sferics net. Predictions of severe weather activity from sferics fixes alone are not reliable. Sferics observations are best used in conjunction with radar reports. Early morning comparison of counts of sferics signals per unit time at the three detection frequencies can provide an indication for the amount of severe weather activity which can be expected later in the day. Comparison of sferics fixes with clear air turbulence showed only negative results, except for one case of a positive correlation of sferics, clear air turbulence, and a hurricane track forty-eight hours later. There was good correlation of sferics fixes with the bright areas in Tiros cloud photographs. (Author)

PB-168 438 Field 4B, 9B
CFSTI Prices: HC$4.00 MF$0.75

Travelers Research Center, Inc., Hartford, Conn.
PROGRAM DESCRIPTIONS; SUPPLEMENT TO THE DEVELOPMENT OF A NUMERICAL PREDICTION MODEL FOR THE PLANETARY BOUNDARY LAYER.
Final rept.,
by Gerald C. Wickham and Marshall A. Atwater.
Jul 65, 123p Rept. no. 7465-174a
Contract Cwb10960

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Programming(Computers), Micrometeorology), (*Boundary layer, Atmospheric models), (*Atmosphere models, Boundary layer), Mathematical models.

Two computer programs (Data Generation Program and Merge I) for a numerical prediction model of the atmospheric boundary layer, developed for the U. S. Weather Bureau, are modified and refined. Two subroutines are added to the Data Generation Program; one extrapolates, from observation at instrument heights, the initial values of various parameters and the other computes initial values of specific parameters for the presence or absence of clouds. Radiative cooling and adjustments due to latent heat effects of suspended liquid water are incorporated into Merge I, and the x and y gradients of various parameters are employed in the computations. Appendixes include definitions of symbols, discussion of printout, other programs used, sample data input forms, and program listings. (Author)

PB-168 475 Field 4B, 22B
CFSTI Prices: HC$3.00 MF$0.75

IBM Corp., Rockville, Md. Federal Systems Div.
WIND SHEAR MEASUREMENT BY SATELLITE-CLOUD TRACKING.
Final rept.
3 Jul 65, 59p
Contract Cwb 10981

Unclassified report

Descriptors: (*Wind, Measurement), (*Meteorological satellites, Feasibility studies), (*Meteorological parameters, Collecting methods), Clouds, Motion, Simulation, Programming(Computers).

This final report presents the results of an analysis of the problem of obtaining vertical wind shear information from satellite observations of the motions of clouds relative to each other. A computer experiment was designed to simulate satellite observations of cloud relative velocities. Analysis data was obtained, using an existing computer program, by simulating satellite observation of clouds at two different altitudes for a range of relative cloud velocities. Measurement errors were induced into the various system parameters, e.g., cloud-top altitude and satellite

attitude (cloud position), for various satellite altitudes. The effects of system errors on the accuracy of the computed shear vector were then determined. Analysis revealed that satellite attitude errors, which result in cloud position errors, are the most important factors in obtaining accurate computed relative cloud velocites. The magnitude of the shear vector error is dependent upon the values of the line of sight vectors used in computing cloud velocities over the tracking period. Errors in cloud-top altitude, as large as 6000 feet, have a negligible effect on the accuracy of the computed shear vector for a satellite at an altitude of 800 nautical miles. The location of the clouds in the sensor field of view also affects the accuracy of the computed shear vector when assessed with errors in satellite attitude. Clouds located near the subsatellite track appear to be the 'best targets' for use in computing relative cloud motions. Cloud direction of motion has a small effect on the accuracy of the computed shear vector. Relative cloud motion perpendicular to the subsatellite track produces the smaller errors when compared to cloud motion parallel to the subsatellite track. (Author)

PB-168 476 Field 4A, 14B
CFSTI Prices: HC$2.00 MF$0.50

Weather Bureau, Washington, D. C.
AN OZONE CALIBRATOR.
Technical note (Meteorological engineering rept.),
by Mary W. Hodge and Keith D. Bell. Aug 65, 26p
Rept. nos. TN-1; METENG-14
Unclassified report

Descriptors: (*Ozone, Volumetric analysis), (*Atmosphere, Ozone), Test equipment, Instrumentation, Chemical analysis.

The design and operation of a simple ozone calibrator is presented. The calibrator is designed to operate over a range of ozone densities from 60 to 250 micrograms per cubic miter. The method is based on Faraday's law of electrolysis and is absolute in its calibration. It consists essentially of an ozone titration of a neutrally buffered potassium iodide solution containing a calibrated quantity of sodium thiosulfate. The calibration of the solution is performed electrochemically with an iodine meter. The equipment was designed specifically to monitor an ozone source which gives a reasonably constant ozone density air stream over a period of several days or weeks of use. However, the source may vary due to aging and other unpredictable changes in various control components of the ozone source. The calibrator gives a repeatability of ±10 percent. (Author)

PB-168 485 Field 4B, 22B
CFSTI Prices: HC$2.00 MF$0.50

Hydrodynamics Lab., Univ. of Chicago, Ill.
EXPERIMENTS RELEVANT TO THE INTERPRETATION OF METEOROLOGICAL SATELLITE OBSERVATIONS.
Final rept. for 1 May 63-31 May 64,
by D. Fultz. Jun 65, 45p Rept. no. HL59B65
Grant Cwb WBG15
Unclassified report

Descriptors: (*Meteorological parameters, Meteorological satellites), Fluid mechanics, Stability, Experimental data.

PB-168 487 Field 4B
CFSTI Prices: HC$3.00 MF$0.75

Atmospheric Research Lab., Univ. of Oklahoma Research Inst., Norman.
EXAMINING THE NATURE OF CONVECTIVE AND OROGRAPHIC CLOUD SYSTEMS USING SATELLITE CLOUD PHOTOGRAPHS.
Final rept. for 1 Jun 64-31 May 65,
by Yoshikazu Sasaki. 31 May 65, 85p
Contract Cwb10863
Unclassified report

Descriptors: (*Meteorological parameters, Meteorological satellites), (*Clouds, Mathematical models), Atmospheric motion, Transport properties, Convection, Photographs.

A simple mathematical model is developed which concerns the formation of cellular cloud patterns found by the satellite photographic observation. Upward turbulent heat and momentum transports from the surface boundary layer to the upper boundary layer (subsidence inversion, for instance) through the fully turbulent layer play important roles in this model. The turbulent layer between the two boundary layers is filled with fully turbulent air where Rayleigh number and Reynolds number are believed to be of the order of 10 to the 9th power to 10 to the 12th power. The conditions necessary to form the fully turbulent air into a flat cellular pattern are obtained by applying the small perturbation method. It is also shown in this paper, by applying the solution to a special case, that the wave length of maximum amplification is a function of depth and eddy coefficients of turbulent layer and static stability of the upper inversion layer, and that the rate of maximum amplification is only a linear function of upward heat flux from the surface boundary layer to the turbulent layer. (Author)

PB-168 489 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
SUBTROPICAL OR POLAR-FRONT JET STREAM,
by Elmar R. Reiter and Linwood F. Whitney. 1965,
29p Technical paper no. TP-66, R-1
Contract Cwb10879
Unclassified report

Rept. on Proj. (WISP) Weather Interpretation from Satellite Pictures. Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.

Descriptors: (*Jet streams(Meteorology), Analysis), (*Meteorological phenomena, Meteorological satellites), Photographs, Polar regions.

By means of satellite photographs originally analysed by Oliver et. al. (1964), it is shown that the Polar Front Jet Stream and the Subtropical Jet Stream do not behave as entities in regions where they approach each other closely. A cross-over of flow is observed whereby the subtropical current overrides and merges with the polar-front jet. In the case of such flow patterns, current nomenclature of jet streams may be misleading. (Author)

UCRL-7865-T (rev 1) Field 4B
CFSTI Prices: HC$4.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
EVALUATION OF SPECTRAL VERSUS GRID METHODS OF HEMISPHERIC NUMERICAL WEATHER PREDICTION,
by Hugh W. Ellsaesser. Aug 64, 126p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Weather forecasting, Numerical methods and procedures).

05. Behavioral and Social Sciences

AD-409 587 Field 5B
CFSTI Prices: HC$1.00

Naval Weapons Lab., Dahlgren, Va.
USER/OPERATOR GUIDE FOR THE NWL TECHNICAL LIBRARY INFORMATION RETRIEVAL SYSTEM COMPUTER PROGRAMS.
Technical memo.,
by D. J. Martin. May 63, 22p Rept. no. K-38/63
Unclassified report

Descriptors: (*Information retrieval, Libraries), (*Data processing systems, Instruction manuals), Programming(Computers), Search theory, Subject indexing, Reports, Computer operators, Naval research, Weapons systems.

The purpose of the Mechanized Information Retrieval System for the NWL Technical Library is three-fold: (1) To permit greater depths of subject matter indexing of publications received by the library. Formerly, because of the manual system, only three or four subject headings were assigned to each publication. In the mechanized system an average of 15 to 20 subject headings (descriptors) is assigned to each document. (2) To permit a more rapid and timely search of the publications contained in the library file. Because of the increased depth of the subject matter indexing, a search may be more specific than was permissible in the past. For instance, an engineer may ask for a listing of all documents pertaining to target detection devices used in the proximity fuse of the Terrier Missile Warhead published since 1961. (3) To prepare a weekly listing (NWL Technical Library Bulletin) of all new publications received by the Technical Library during the previous week. The format of this listing is such that it can be cut into three by five size sheets and used for filing by the Technical Library.

N65-21386 Field 5A, 5I
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
GOVERNMENT RESEARCH, THE ENGINEER, AND THE PROFESSIONAL SOCIETY,
by I. E. Garrick. 1965, 10p NASA-TM-X-56295
Unclassified report

Presented at the Annual Meeting, Southeastern Section, American Society for Engineering Education (31st), at Richmond, Va., 12-13 Apr 65.

Descriptors: (*Scientific research, Professional personnel), Engineering personnel, Education.

N65-23656 Field 5A, 12B, 15E
CFSTI Prices: HC$1.00 MF$0.50

RAND Corp., Santa Monica, Calif.
TWO MODELS FOR TIME CONSTRAINED MAINTENANCE,
by Ernest M. Scheuel. Apr 65, 17p RM-4518-NASA
Contract NASr-21(08)
NASA CR-62697
Unclassified report

Descriptors: (*Maintenance, Statistical analysis), (*Operation research, Maintenance), Mathematical models, Probability.

N65-27739 Field 5H, 22B
CFSTI Prices: HC$2.00 MF$0.50

Bunker-Ramo Corp., Canoga Park, Calif.
MODERN CONTROL SYSTEM THEORY AND HUMAN CONTROL FUNCTIONS,
by R. W. Obermayer and F. A. Muckler.
Jul 65, 45p
Contract NASw869
NASA CR-256
Unclassified report

Descriptors: (*Control system's, Theory), (*Human engineering, Control systems), Mathematical analysis, Matrix algebra, Optimization.

ORNL-3793 Field 5B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE ORNL BOOK CIRCULATION CONTROL SYSTEM,
by G. K. Haeuslein, R. R. Dickison, and A. S. Haas. Jul 65, 27p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Libraries, Control systems).

PB-168 120 Field 5J
CFSTI Prices: HC$2.00 MF$0.50

Chicago Univ., Ill. Psychometric Lab.
METHODOLOGY OF PREFERENCE MEASUREMENT. PREDICTION OF CONSUMER CHOICE.
Phase rept. for 1 Nov 54-31 May 55,
by Lyle V. Jones and R. Darrell Bock. 31 May 55, 31p
Rept. no. 1
Contract DA19 129QM272, Proj. 7 84 15 007
DSSC P-1101-1
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Psychometrics, Decision making), (*Decision making, Psychometrics), Taste, Food, Selection, Analysis of variance, Sampling, Optimization.

A method is derived for the selection of a small panel of judges for preference testing from a larger group of individuals. That panel of judges is selected which is most representative of the group as a whole. The method is outlined and illustrated with a numerical example. (Author)

PB-168 182 Field 5B, 9B, 5K, 5J
CFSTI Prices: HC$1.00 MF$0.50

Harvard Univ., Cambridge, Mass.
A COMPUTER APPROACH TO CONTENT ANALYSIS: STUDIES USING THE GENERAL INQUIRER SYSTEM,
by Philip J. Stone and Earl B. Hunt. 1964, 16p
Grant NIMH M4169, Proj. NR047 003
Unclassified report

Prepared in cooperation with Sydney Univ. (Australia). Proceedings - Spring Joint Computer Conference v23 p241-256, 1963.

Descriptors: (*Subject indexing, Programming(Computers)), (*Behavior, Documentation), (*Information retrieval, Computers), Analysis, Punched cards, Data processing systems, Dictionaries, Psychology, Sociology, Criminology.

The General Inquirer is an IBM 7090 program system that was developed at Harvard in the spring of 1961 for content analysis research problems in the behavioral sciences. The first part of the paper describes this system and how it has been used. During the summer of 1962, the General Inquirer was merged with the Hunt Concept Learner to produce a method for automatic theme analysis. The second part of the paper discusses the rationale behind this development and some recent signs of its future promise.

PB-168 202 Field 5A, 5C
CFSTI Prices: HC$6.00 MF$1.50

Stanford Univ., Calif. Inst. for Mathematical Studies in the Social Sciences.
AN EMPIRICAL STUDY OF EXACTLY AND APPROXIMATELY OPTIMAL INVENTORY POLICIES-TABLES,
by Harvey M. Wagner, Michael O'Hagan, and Bertil Lundh. 1 Jun 64, 265p Technical rept. no. TR-5
Grant NSF G24064

Unclassified report

Descriptors: (*Inventory analysis, Tables), Statistical distributions, Optimization, Costs, Inventory control.

PB-168 228 Field 5A, 14B
CFSTI Prices: HC$1.25 MF$0.75

Naval Research Lab., Washington, D. C.
REPORT OF NRL PROGRESS.
Jul 65, 54p

Unclassified report

Also available on subscription from CFSTI $10.00 per year domestic, $13.00 per year foreign.

Descriptors: (*Naval research, Reports), (*Trosposphere, Ions), (*Halides, Crystal structure), Aerosols, Radioactive isotopes, Atmosphere, Astrophysics, Chemistry, Plastic coatings, Organic compounds, Mechanics, Steesses, Metallurgy, Ceramic materials, Mechanical properties, Bonding, Nuclear physics, Atoms, Optics, Radio communication systems, Solid state physics, Sound, Underwater sound.

Complete papers: The mobility of tropospheric ions above the exchange layer; and Ionized F-aggregate centers in alkali halide crystals. Summaries are given of research in the following fields: atmosphere and astrophysics, chemistry, mechanics, metallurgy and ceramics, nuclear and atomic physics, optics, radio, solid state physics, and sound.

PB-168 282 Field 5B
CFSTI Prices: HC$3.00 MF$0.75

Herner and Co., Washington, D. C.
MODULAR CONTENT ANALYSES.
Final rept.,
by F. W. Lancaster, Saul Herner, and Mary Herner.
Jun 65, 78p
Contract NSF C329

Unclassified report

Descriptors: (*Reports, Processing), (*Subject indexing, Distribution), (*Abstracting, Distribution), Journals, Indexes, Standardization, Information retrieval, Documentation, Heat transfer.

An investigation was undertaken of the feasibility of preparing abstracts and index entries for documents in such a form that they could be used as inputs to a large number of different abstracting publications. The term, 'Modular Content Analyses,' was applied to the abstract-index entry 'packages.' A Modular Content Analysis for a document is composed of form modules of varying degrees of descriptive depth: citation, annotation, indicative abstract, informative abstract, critical abstract, plus a set of suggested index entries. Specimen Modular Content Analyses were prepared by subject experts for 116 articles on Heat Transfer, which was selected because it is covered by a wide variety of abstracting services, but has no single service specifically dedicated to it. Sample Modular Content Analyses were sent to 54 abstracting publications for their evaluation and possible use. Evaluations of individual Analyses, 133 in total, were received from 28 of these abstracting publications. The overall evaluations of the specimen 'packages' were favorable, although the indication of probable use if they were made generally available was somewhat less than favorable. The concept of the modular approach to abstracting was further evaluated by means of a final questionnaire addressed to the editors of 128 abstract journals. Responses were received from 71 of these. Approximately 40 per cent indicated possible willingness and ability to make use of a centrally-produced content description in modular form. (Author)

PB-168 336 Field 5B
CFSTI Prices: HC$1.00 MF$0.50

Westat Research Analysts, Inc., Bethesda, Md.
CONTROL OF INDEXING ERRORS,
by E. C. Bryant. Apr 65, 16p Rept. no. WRA-PO-16
Contract C3 65

Unclassified report

Descriptors: (*Information retrieval, subject indexing), (*Subject indexing, Errors), Quality control, Mathematical analysis, Theory.

Theoretical considerations are given to methods for attaining quality control of errors in the assignment of indexing terms to documents for their eventual retrieval by use of those indexing terms. A system is used in which tags from a controlled list or dictionary are assigned without weights; this results in a document-term connection matrix of zeroes and ones. The theoretical considerations include instances for (1) control where exact indexing can be defined, (2)control where exact indexing cannot be determined, and (3) relative efficiency of alternative schemes for estimating inconsistencies made by indexers. Suggestions are made for the management of the quality control system to be used in the assignment of indexing terms.

PB-168 421 Field 5B
CFSTI Prices: HC$4.00 MF$1.00

Institute for Scientific Information, Philadelphia, Pa.
ARTICLE-BY-ARTICLE COVERAGE OF SELECTED ABSTRACTING SERVICES.
31 Oct 64, 131p
Contract NSF C332

Unclassified report

Descriptors: (*Scientific research, Periodicals), (*Abstracting, Periodicals), (*Periodicals, Abstracting), Documentation, Biology, Chemistry, Physics, Indexes, Reports, Information retrieval, Computers, Punched cards, Errors, Statistical analysis.

PB-168 429 Field 5A
CFSTI Prices: HC$2.00 MF$0.50

Alfred P. Sloan School of Management, Mass. Inst. of Tech., Cambridge.

RESEARCH PROGRAM ON THE ORGANIZATION AND MANAGEMENT OF R AND D. PROBLEM SOLVING STRATEGIES IN PARALLEL RESEARCH AND DEVELOPMENT PROJECTS,
by Thomas J. Allen. Jun 65, 28p Rept. no. 126-65
Unclassified report

Supported by NASA and NSF.

Descriptors: (*Research program administration, Feasibility studies), (*Management planning, Scientific research), Scientific personnel, Behavior.

Three pairs of parallel R and D projects are examined. The data analyzed were gathered by means of Solution Development Records--a form which provides a weekly estimate of the probability of adoption of the approaches under consideration as possible solutions to a technical problem. It is found that the longer an approach is indicated by these forms to be in a favored position, the more difficult it is to reject. Furthermore, the number of alternative technical approaches considered bears a relation to judged solution quality. Groups producing higher-rated solutions generated fewer approaches during the course of the project, and they more closely approach an ideal strategy of approaches off on a two-at-a-time basis than do their poorer performing rivals. (Author)

PB-168 430 Field 5A
CFSTI Prices: HC$2.00 MF$0.50

Alfred P. Sloan School of Management, Mass. Inst. of Tech., Cambridge.
SOURCES OF IDEAS AND THEIR EFFECTIVENESS IN PARALLEL R AND D PROJECTS,
by Thomas J. Allen. Jul 65, 28p
Rept. no. 130-65
Grants NaNsg235 62, NSF GN233
Unclassified report

Presented at the ONR Conference on Research Program Effectiveness (2nd), Washington, D. C., 28 Jul 65.

Descriptors: (*Research program administration, Feasibility studies), (*Management planning, Effectiveness), Scientific research, Communication theory.

Seven sets of parallel R and D projects involving 15 laboratories are examined. Data gathered by Solution Development Records--a form which provides a weekly estimate of the probability of adoption of the approaches under consideration as possible solutions to a technical problem--and post-project interviews with the engineers responsible for each problem. The sources of technical approaches, indicated on the Solution Development Records, were obtained during the post-project interviews. Eight possible sources of ideas are considered. Better performing groups are found to rely more than poorer performers upon information sources within the laboratory, for generation of ideas. A serious misalignment appears to exist between the quality of ideas generated through the eight channels and the frequency with which these channels are used by engineers. Vendors and analysis and experimentation, by the engineer himself, appear to be over-utilized relative to their effectiveness as idea sources, while information available from other company research programs and from the lab's technical staff is under-utilized. (Author)

PB-168 431 Field 5A
CFSTI Prices: HC$2.00 MF$0.50

Alfred P. Sloan School of Management, Mass. Inst. of Tech., Cambridge

STUDIES OF THE PROBLEM SOLVING PROCESS IN ENGINEERING DESIGN,
by Thomas J. Allen. 1965, 36p
Grants NSF GN233, NSF GN353
Unclassified report

Prepared for presentation at Institution of Electrical Engineers' Conference on Electronics Design, London, England, 8 Feb 65.

Descriptors: (*Engineering, Design), (*Management engineering, Decision making), Management control systems, Management planning, Behavior, Statistical analysis, Electronics, Research program administration.

PB-168 439 Field 5B, 5G, 9B
CFSTI Prices: HC$3.00 MF$0.75

Lehigh Univ., Bethlehem, Pa. Center for the Information Sciences.
CURRICULUM FOR THE INFORMATION SCIENCES. REPORT NO. 5: OUTLINE AND BIBLIOGRAPHY FOR A COURSE IN SYNTAX,
by A. F. Brown and N. P. Melchert. Sep 65, 62p
Rept. no. 5 Unclassified report
Grant NSF GE2569
See also PB-167 519, PB-167 800.

Descriptors: (*Language, Education), (*Documentation, Education), (*Education, Information retrieval), Bibliographies, Computers, Analysis.

Contents (numbers following topics indicate the suggested number of weeks (3 class hours/week) for each):
Course introduction (1)
Phrase-structure grammars, immediate constituent and dependency trees (3)
Limitations of phrase-structure grammars (3)
Transformations (3)
Formal properties of grammars; relation to machines (2)
Categorical grammars and an algorithm for deciding whether a string is a sentence (2)
Extensions of syntax
Discourse analysis (1)
Deviation from norms (2)
Syntax and semantics (2)
Applicability to problems of information retrieval (2)
Bibliography.

PB-168 440 Field 5C, 5I
CFSTI Prices: HC$1.00 MF$0.50

Arms Control and Disarmament Agency, Washington, D. C. Economics Bureau.
THE DYNA-SOAR CONTRACT CANCELLATION, A STATISTICAL SUMMARY,
by Robert Brandwein. Jul 65, 23p
Unclassified report

Descriptors: (*Government procurement, Economics), (*Disarmament, Economics), (*Economics, Disarmament), Statistical analysis, Weapon systems, Boost-glide vehicles, Manpower studies.

This article is a statistical summary of some of the information obtained in a survey of displaced defense workers. It is anticipated that the publication of greater statistical detail and analysis of the material for manpower policy implications will be possible later.

PB-168 441 Field 5C, 5K
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor.

SURVEY OF ECONOMIC MODELS FOR ANALYSIS OF DISARMAMENT IMPACTS,
by Daniel B. Suits. 1965, 57p
Contract ACDA E59

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Government procurement, Economics), (*Disarmament, Economics), (*Economics, Disarmament), Mathematical models, Analysis, Statistical processes.

Intelligent planning of defense cutbacks and evaluation of policies intended to mitigate their impact on the economy necessitates measurement of these economic responses. We need to know how much a proposed defense reduction will reduce employment, and how the loss of jobs will be distributed over industries, regions, and occupations. We need to know how much effect an offsetting tax reduction or state expenditure program will have in creating new jobs, and how these will be distributed by industry, region, and occupation. We need the most accurate estimates in the greatest detail commensurate with cost. As used in this report, the term economic model means a statistical research procedure that can be used to obtain these estimates. Four types of model are included in this report: (1) Econometric models, (2) input-output analysis, (3) regional models, and (4) microeconomic simulation. The nature of each technique will be presented and its use in policy analysis will be discussed. (Author)

PB-168 454 Field 5B
CFSTI Prices: HC$1.00 MF$0.50

Lehigh Univ., Bethlehem, Pa. Center for the Information Sciences.
CURRICULUM FOR THE INFORMATION SCIENCES. REPORT NO. 6: SYLLABUS FOR A COURSE IN MANAGEMENT INFORMATION SYSTEMS,
by W. A. Smith, Jr. Sep 65, 18p
Grant NSF GE2569

Unclassified report

See also PB-168 439.

Descriptors: (*Documentation, Education), (*Management engineering, Education), Data processing systems, Cybernetics, Real time, Computers, Decision making, Information retrieval, Programming(Computers), Computer storage devices, Tests, Simulation, Feasibility studies.

The body of principle and the total systems approach offered in the course as given are valid for industrial, management, or documentary information systems. Emphasis and example differ. These differences are primarily those associated with the problems of packaging, currency, data analysis, and storage or memory. While these differences exist, it should be noted that the intent remains the same: to inform for decision, with currency, even immediacy, as a primary criterion of industrial and management systems. The topics to be discussed during the course are as follows. (1) introduction to the course and its aims; introduction to the concepts of system and cybernetics. (2) Information systems and decision making. (3) Total systems concept. (4) Information systems analysis. (5) Information system design and installation. (6) On-line computing systems (Con-line, in-line, and real-time concepts). (7) On-line computing systems (time sharing, multiprogramming, and multiprocessing). (8) Programming/operating systems. (9) Memory requirements. (10) Programming and testing on-line systems. (11) Implementation of on-line systems; accuracy of information. (12) Evaluation of systems. (13) Simulation. Feasibility studies. (14) Organizational effects.

TID-5001 (5th rev) Field 5B
CFSTI Prices: HC$6.00 MF$1.50

Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
SUBJECT HEADINGS USED BY THE USAEC DIVISION OF TECHNICAL INFORMATION,
ed by Robert E. Upchurch. Jul 25, 272p

Unclassified report

Descriptors: (*Information retrieval, Subject indexing), (*Subject indexing, Handbooks).

06. Biological and Medical Sciences

BNL-7745 Field 6P
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE ZINC PATHWAY THROUGH THE BODY RECEPTORS FOR ZINC AND COMPETITION BY CADMIUM IN TISSUES.
Report on Tissue receptors for zinc and cadmium,
by P. S. Papavasiliou and G. C. Cotzias. 17 Jan 64, 26p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Zinc, Metabolism), (*Cadmium, Metabolism).

BNL-7804 Field 6L, 14E
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A DESICCANT-HOLDING SLIDE BOX FOR RADIOAUTOGRAPHIC EXPOSURE.
Report on Box for Radiography,
by Julius M. Elias. 1960, 7p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Medical supplies, Autoradiography), (*Desiccants, Medical supplies).

BNL-7945 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
INHERITANCE OF ALKALOIDS IN INTROGRESSIVE HYBRIDS OF NICOTIANA,
by Harold H. Smith. 1964, 15p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Plants(Botany), Genetics), (*Alkaloids, Genetics), (*Genetics, Plants(Botany)).

LADC-6449 Field 6C, 6L
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
A DIGITIZED COMPARATOR FOR KARYOTYPE ANALYSIS,
by P. M. Labauve, R. J. Labauve and D. F. Petersen. 1963, 15p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Chromosomes, Digital systems).

N65-24294 Field 6S, 3A
CFSTI Prices: HC$1.00 MF$0.50

IIT Research Inst., Chicago, Ill.
LIFE IN EXTRATERRESTRIAL ENVIRONMENTS.
Quarterly status report, 15 Feb-15 May 1965,
by Charles A. Hagen. 1965, 13p IITRI-L6023-1
Contract NASr-22
NASA CR-62829
Unclassified report

Descriptors: (*Space biology, Mars).

Patent 3,199,626 Field 6Q, 22A

INSTANT BONDING ATTACHMENT MECHANISM.
Patent assigned to Air Force,
by Peter N. Van Schaik and Chester B. May. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Maintenance personnel, Safety defices), (*Astronauts, Safety harness), (*Safety harness, Astronauts), Satellites(Artificial), Surfaces, Space environmental conditions, Weightlessness, Patents, Adhesives.

A system is provided for attaching a man to the outer surface of a orbiting satellite so that he can perform extra-vehicular maintenance. Adhesive pads are stored in dispensing mechanisms which are attacked to extendible arms. The extendible arms are attached to the propulsion unit secured to the back of the man. The adhesive pads consist of thermal setting adhesives bonded to thin discs. When the adhesive pad is pressed against a surface and heated to activate the adhesive it permanently bonds itself to the surface. To release the man from the work site the adhesive pad is released from the dispensing mechanism.

Patent 3,200,142 Field 6L, 7C

SURFACE-ACTIVE COMONOMER AND METHOD OF PREPARATION.
Patent assigned to HEW,
by Rafael L. Bowen. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Dentistry, Materials), Sealing compounds, Surface-active substances, Copolymerization, Plastics, Sodium compounds, Salts, Acrylic resins, Aromatic compounds, Amino acids, Patents.

The resin provides a water-resistant seal or bond between a polymer-containing direct filling material and the wall of a tooth cavity. A comonomer is prepared by admixing, in the presence of an aqueous solvent, equimolar quantities of the sodium salt of N-phenyl glycine and glycidyl methacrylate, subjecting the admixture with stirring, to a temperature between 23 degrees C. to 30 degrees C. for 2.5 hours, and separating the precipitate from the mother liquor by acidification to a pH of approximately 4.

Patent 3,201,387 Field 6O, 7C

5-TRIFLUOROMETHYLURACIL, DERIVATIVES THEREOF, AND PROCESSES FOR PREPARING THE SAME.
Patent assigned to HEW,
by Charles Heidelberger. 17 Aug 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*N-heterocyclic compounds, Synthesis-(Chemistry)), (*Fluorine compounds, Synthesis-(Chemistry)), (*Chemotherapeutic agents, N-heterocyclic compounds), (*Antimetabolites, N-heterocyclic compounds), Fluorination, O-heterocyclic compounds, Pyrimidines, Deoxyribonucleic acid, Enzymes, Patents.

Two of the products claimed are 5-trifluoromethyluracil and 5-trifluoromethyl-2'-deoxyuridine. The products have useful biological properties. The latter product is highly cytotoxic to mammalian cells in tissue culture. Both of the above compounds inhibit the growth of Escherichia coli B, and also are highly mutagenic to and inhibit the production of T4 phage in E. coli B.

PB-168 119 Field 6T, 15B
CFSTI Prices: HC$2.00 MF$0.50

Chemical Corps Medical Labs., Army Chemical Center, Md.
A TOXICO-PATHOLOGIC STUDY OF PHOSGENE OXIME.
Research rept.,
by Arthur J. McAdams, Jr. and Milton H. Joffe. Jul 65, 27p Rept. nos. RR-381; CMLRE-ML-52
AD 73 158
Declassified 19 Oct 60. Unclassified report

Descriptors: (*Phosgene, Toxicity), Oximes, Poisoning, Skin, Edema, Lungs, Tissues(Biology), Wounds + injuries, Histological techniques, Pathology, Poisonous gases, Chemical warfare agents, Dosage, Guinea pigs, Humans.

The local lesion produced by aqueous dilutions of phosgene oxime applied cutaneously and intradermally have been described. They may be considered as corrosive type lesions, the course being that usually seen with escharotics. The clinical-pathological features of the pulmonary edema produced by phosgene oxime are described. The relationship of concentration of solution and area of contact between skin and agent with respect to manifestation of systemic toxicity were investigated. Systemic toxic signs are correlated directly with concentration of solution used and inversely with area exposed. The mechanism of toxic action of phosgene oxime and phosgene gas are considered. Reasons are given for believing that the local action of both is of a physicochemical nature. The reasons for the production of massive pulmonary edema as a consequence of cutaneous or intravenous administration of phosgene oxime are unclear. (Author)

PB-168 337 Field 6P, 6R
CFSTI Prices: HC$2.00 MF$0.50

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
LONG-TERM THYROID VALUES AFTER INTAKE OF RADIOACTIVE IODINE. (Bilans Thyroidiens de Longue Duree Apres Administration d'Tode Radioactif),
by Rene Riviere. Jul 65, 50p
Rept. no. CEA-R-2787
Unclassified report

Text in French, attached summary in English.

Descriptors: (*Thyroid gland, Metabolism), Iodine, Radioactive isotopes, Tracer studies, Blood plasma, Urine, Excretion, Pathology.

In connection with a compartment theory, a kinetic study of thyroid metabolism in man requires the determination of the specific iodine activity at all accessible levels (plasma, urines, feces), during periods of over a

month. The basic methods required for such a study are therefore the use of iodine-125 as a tracer, the exact determination of iodine-127 using activation analysis and the setting-up of a daily diet of constant iodine content. The results are presented for each particular case and the main parameters of thyroid metabolism are calculated. The discussion includes some special considerations concerning the pathological condition of the subject or a break in the thyroid equilibrium. It shows in particular that constant disagreement exists between the experimental curves for the specific iodine activity and the corresponding theoretical curves for a conventional thyroid process based on 3 compartments; these discrepancies concern both the inorganic iodine and the organic iodine eliminated with the feces.

PB-168 339 Field 6R
CFSTI Prices: HC$2.00 MF$0.50

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
DOSAGE OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA BY NEUTRON ACTIVATION WITHOUT CHEMICAL SEPARATION. (Dosage du Sodium et du Potassium dans les Milieux Biologiques par Activation Neutronique sans Separation Chimique),
by Georges Marble, Michel Bernier, Michel Bertet and Gaston Gaude. Jul 65, 31p Rept. no. CEA-R-2837
Unclassified report

Text in French, attach summary in English.

Descriptors: (*Sodium, Neutron activation), (*Potassium, Neutron activation), (*Neutron activation, Alkali metals), (*Tissue(Biology), Radioactivation analysis), Gamma emission, Beta particles, Scintillation counters, Dosage, France.

A relatively simple method for dosing sodium and potassium in biological media was developed. No chemical separation is required. The measurement of the gamma and beta activities induced by activation is carried out using scintillation detectors connected to a multi-channel amplitude selector and a counting unit. The results obtained are excellent for the sodium, and satisfactory in the case of potassium in biological experiments. (Author)

PB-168 342 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
CRITICAL STUDY OF SOME SOFT-TISSUE EQUIVALENT MATERIAL. SENSITIVITY TO NEUTRONS OF 1keV TO 14 MeV. (Etude Critique de Quelques Materiaux Equivalents aux Tissues mous. Sensibilite aux Neutrons de 1 keV a 14 MeV),
by Herve de Kerviler and Lucien Pages. Jul 65, 20p
Rept. no. CEA-R-2833
Unclassified report

Text in French, attached Summary in English.
Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.

Descriptors: (*Tissue(Biology, Simulation), (*Neutrons, Radiobiology), Neutron reactions, Plastics, Polyethylene plastics, Magnesium compounds, Fluorides, Neutron bombardment, Sensitivity, Gamma rays, France.

A study was made of the elastic and inelastic reactions on various elements contribution to kerma in standard soft tissue and as a function of neutron energy from 1 keV to 14 MeV the ratio of kerma in tissue equivalent material to kerma in soft tissue. The results of calculations are made for materials without hydrogen in view to state exactly their neutron sensitivity and for the following hydrogeneous materials: Rossi and Failla plastic, MixD, pure polyethylene and a new CEA tissue equivalent (a magnesium fluoride and polyethylene compound). Results for gamma-rays are given. (Author)

PB-168 352 Field 6R
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Pierrelatte (France). Centre de Pierrelatte.
SUPERVISION OF PROFESSIONAL PERSONNEL EXPOSED TO IONIZING RADIATION (X-RAYS) (Surveillance du Personnel Professionnellement Expose aux Radiations Ionisantes (Rayons X)).
Doctoral thesis,
by Jacques Chalabreysse. 1965, 73p
Rept. no. CEA-R-2746
Unclassified report

Text in French with attached summary in English.

Descriptors: (*X rays, Radiation hazards), (*Radiation hazards, Professional personnel), Medical personnel, Dosimeters, Radiological dosage, Exposure, Hematology, Computers.

After a short introduction giving the physical characteristics and the possible interactions of X-rays, this report considers in more detail the basis of the dosimetry and the units used. Taking into account the dangers of irradiation and the professional norms applicable, the report reviews the physical methods (collective and individual dosimetry) and the biological method (based on the systematic supervision of the haemogram) which are used to ensure that these professional norms are respected. As an example the influence is studied of repeated doses of X-rays on the haemogram of X-ray operators when the individual radiation levels are known through dosimetric films. Two processes are used: one considers the mean values (irradiation and average haemogram for each person), the other requires the use of an electronic computer and uses each haemotological variable as a function of the monthly or cumulative doses; it gives correlation coefficients for the diffedifferent variables. The results obtained are compared to those conventionally accepted, and the validity of the haemogram is estimated as a criterion for the supervision. (Author)

PB-168 490 Field 6E, 6A, 6O, 6P
CFSTI Prices: HC$1.00 MF$0.50

Biological Sciences Communication Project, George Washington Univ., Washington, D. C.
CONVENTIONAL SUBJECT INDEX FOR ANGIOLOGY, VOLUMES 8-12 (1957-1961).
Mar 64, 18p
Grant PHS HE07582 01
Unclassified report

Descriptors: (*Blood vessels, Subject indexing), Cardiovascular system, Cardiovascular diseases, Veins, Arteries, Physiology, Pathology, Pharmacology, Blood chemistry, Atherosclerosis, Thrombosis, Anticoagulants, Vasoactive agents.

PB-168 492 Field 6O, 6T
CFSTI Prices: HC$5.00 MF$1.00

Biological Sciences Communication Project, George Washington Univ., Washington, D. C.

PHARMACOLOGY, TOXICOLOGY AND COSMETICS SERIALS, THEIR IDENTIFICATION AND AN ANALYSIS OF THEIR CHARACTERISTICS,
by Charles W. Shilling and Mildred Benton. Sep 65, 174p BSCP-22-65
Grant NIH GM11711 02

Unclassified report

Descriptors: (*Pharmacology, Periodicals), (*Toxicity, Periodicals), (*Toilet articles, Periodicals), Drugs, Biochemistry, Libraries, Information retrieval, Abstracting.

TID-20310 Field 6A, 7E
CFSTI Prices: HC$2.00 MF$0.50

Michigan State Univ., East Lansing. Dept. of Biophysics.
THE EFFECT OF THE PHYSICAL ENVIRONMENT ON EXCITED STATES OF AMINO ACIDS AND PROTEINS,
by Jayanti Nag-Chaudhuri and Leroy Augenstein.
1963, 27p Unclassified report
Contract AT(11-1)-1155
Descriptors: (*Amino acids, Excitation), (*Proteins, Excitation).

TID-21497 Field 6P
CFSTI Prices: HC$2.00 MF$0.75

Loyola Univ., Chicago, Ill.
THE EFFECT OF PARATHYROID HORMONE ON CARBOHYDRATE METABOLISM.
Final rept.
1964, 48p Unclassified report
Contract AT(11-1)-955
Descriptors: (*Parathyroid hormones, Metabolism).

TID-21526 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Southern Research Inst., Birmingham, Ala.
ATTEMPTS TO DEVELOP MAMMALIAN SYSTEMS RESISTANT TO IONIZING RADIATION.
Final rept.,
by Glynn P. Wheeler. 22 Sep 64, 25p
SRIB-6972-1505-1 Unclassified report
Contract AT(40-1)-3093
Descriptors: (*Radiation effects, Mammals), (*Mammals, Radiation effects).

TID-21584 Field 6M, 6R
CFSTI Prices: HC$1.00 MF$0.50

Longwood Coll., Farmville, Va.
TERMINAL REPORT ON CYTOLOGICAL, PHYSIOLOGICAL AND GENETIC PROBLEMS IN T. PYRIFORMIS,
by Carolyn Wells. 15 Dec 64, 8p Unclassified report
Contract AT(40-1)-2793
Descriptors: (*Ciliata, Radiation effects), (*Genetics, Ciliata).

UCRL-12389 Field 6P, 6A
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
MAGNETIC FIELDS, VAGAL INHIBITION, AND ACETYLCHOLINESTERASE ACTIVITY,
by W. I. Young and John W. Gofman. Feb 65, 18p
Contract W-7405-eng-48 Unclassified report

Descriptors: (*Acetylcholinesterase, Cardiovascular system).

07. Chemistry

N65-18960 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SPECTROGRAPHIC SOLUTION ANALYSIS OF ALUMINUM ALLOYS,
by D. Hamilton and S. Corbitt. 20 Jan 65, 21p
NASA-TM-X-53192

Unclassified report

Descriptors: (*Aluminum alloys, Spectroscopy), (*Spectroscopy, Aluminum alloys).

N65-23663 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Florida Univ., Gainesville.
LOWER BOUNDS TO ENERGY EIGENVALUES FOR THE STARK EFFECT IN A RIGID ROTATOR,
by Jong H. Choi and Darwin W. Smith. 1965, 16p
Grant NsG-512
NASA CR-62664

Unclassified report

Descriptors: (*Line spectra, Energy).

N65-24041 Field 7D, 20M
CFSTI Prices: HC$2.00 MF$0.50

Wisconsin Univ., Madison. Theoretical Chemistry Inst.
THE DENSITY EXPANSIONS OF THE TRANSPORT COEFFICIENTS,
by David K. Hoffman. 15 May 64, 40p WIS-TC1-48
Grant NsG-275-62
NASA CR-56919

Unclassified report

Descriptors: (*Statistical mechanics, Gases), (*Gases, Transport properties).

N65-26253 Field 7D, 20F
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
THE VACUUM ULTRAVIOLET RADIATION FROM N(+)- AND O(+)-ELECTRON RECOMBINATION IN HIGH-TEMPERATURE AIR,
by Gerhard E. Hahne. Jun 65, 54p
NASA-TN-D-2794

Unclassified report

Descriptors: (*Ultraviolet radiation, Photochemistry), (*Photochemistry, Ultraviolet radiation).

N65-26639 Field 7D, 20M
CFSTI Prices: HC$1.25 MF$0.75

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
CHARTS FOR APPROXIMATE THERMODYNAMIC PROPERTIES OF NITROGEN-OXYGEN MIXTURES,
by Bruce Fowler and Ronald D. Brown. 1965, 116p
NASA-SP-3017

Unclassified report

Descriptors: (*Nitrogen, Thermodynamics), (*Oxygen, Thermodynamics).

N65-26651 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
COMPARISONS OF EXPERIMENTAL HYDROXYL RADICAL PROFILES WITH KINETIC CALCULATIONS IN A SUPERSONIC NOZZLE,
by Edwin A. Lezberg, Charles M. Rose, and Robert Friedman. Jun 65, 26p NASA-TN-D-2883
Unclassified report

Descriptors: (*Hydroxides, Reaction kinetics), (*Supersonic flow, Absorption spectrum).

N65-26656 Field 7D, 20M
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
THERMODYNAMIC PROPERTIES OF CESIUM UP TO 1500K,
by Sheldon Heimel. Jul 65, 30p NASA-TN-D-2906
Unclassified report

Descriptors: (*Cesium, Thermodynamics), (*Thermodynamics, Cesium).

NYO-1930-40 Field 7E
CFSTI Prices: HC$3.00 MF$0.50

Clark Univ., Worcester, Mass. Dept. of Chemistry.
RESEARCH IN NUCLEAR AND RADIOCHEMISTRY.
Progress rept. for period ending 31 Jan 65,
by T. T. Sugihara. 1965, 53p
Contract AT(30-3)-1930
Unclassified report

Descriptors: (*Radiochemistry, Reviews).

NYO-2728-4 Field 7C
CFSTI Prices: HC$4.00 MF$0.75

State Univ. of New York, Syracuse. Coll. of Forestry.
RATES OF HYDROGEN ABSTRACTION FROM VARIOUS SUBSTRATES BY FREE RADICALS. FINAL REPORT. PART I. A STUDY OF RELATIVE RATES OF HYDROGEN ATOM ABSTRACTION FROM ATROMATIC MOLECULES BY METHYL RADICALS (THESIS). PART II. ADDITIONAL DATA FOR TRIPHENYLMETHANE, 1,2-DIPHENYLETHANE AND PARA-T-B,
by John A. Meyer and Alan Campbell Eachus.
1 Mar 65, 106p
Cont.act AT(30-1)-2728
Unclassified report

Descriptors: (*Free radicals, Chemical reactions).

NYO-2780-1 Field 7D, 7C, 18J
CFSTI Prices: HC$4.00 MF$1.00

Temple Univ., Philadelphia, Pa.
CONDUCTIVITY STUDIES IN LOW MELTING FUSED SALTS AND ELUCIDATION OF THE PROPERTIES OF POTASSIUM DINITRATOTETRACHLOROCOBALTATE(II).
Doctoral thesis,
by Martin Goffman. May 65, 136p
Contract AT(30-1)-2780
Unclassified report

Descriptors: (*Liquid metal coolants, Electrical conductance), (*Potassium compounds, Physical properties).

NYO-3217-1 Field 7C, 7D
CFSTI Prices: HC$2.00 MF$0.50

State Univ. of New York, Buffalo.
MICROCATALYTIC BENZENE HYDROGENATION STUDIES ON TRANSITION METAL-GROUP Ib METAL ALLOYS.
Technical progress rept.,
by D. A. Cadenhead. 22 Feb 65, 33p
Contract AT(30-1)-3217
Unclassified report

Descriptors: (*Aromatic compounds, Hydrogenation), (*Catalysts, Transition elements).

ORNL-3804 Field 7B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
RARE-EARTH HALIDES,
by R. E. Thema. May 65, 59p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Rare earth compounds, Halides), (*Halides, Rare earth compounds).

ORNL-3821 Field 7B, 11F
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
IDENTIFICATION OF CARBIDES, NITRIDES, AND OXIDES OF NIOBIUM AND NIOBIUM ALLOYS BY ANODIC STAINING,
by R. S. Crouse. Jul 65, 11p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Niobium compounds, Coloring), (*Niobium alloys, Coloring).

PB-168 347 Field 7B, 7C
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
EXTRACTION OF SOME ACIDS USING ALIPHATIC AMINES (Extraction de Quelques Acides par des Amines Aliphatiques).
Doctoral thesis,
by Luis Matutano. 1965, 59p
Rept. no. CEA-R-2760
Unclassified report

Text in French with attached summary in English.

Descriptors: (*Inorganic acids, Separation), (*Carboxylic acids, Separation), (*Amines, Aliphatic compounds), Hydrochloric acid, Nitric acid, Sulfuric acid, Perchloric acid, Phosphoric acids, Water, Salts, Ion exchange, Ion exchange resins, Acids.

Hydrochloric, nitric, sulphuric, perchloric, phosphoric, acetic and formic acids in aqueous solution (0.05 to 10 M) are extracted by amberlite LA2 and trilaurylamine in solution, 5 per cent by volume, in kerosene and xylene respectively. The extraction process consists of: neutralization of the amine salt; a 'molecular extraction', i.e. an extraction using an excess of acid with respect to the stoichiometry of the amine salt. According to the behaviour of the acid during the extraction, three groups may be distinguished: completely dissociated acids, carboxylic acids, phosphoric acid. This classification is also valid for the extraction of the water which occurs simultaneously with that of the acid. An extraction mechanism is put forward for formic acid and the formation constant of its amine salt is calculated. (Author)

PB-168 349 Field 7B, 7C
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
ANALYTICAL METHODS USED IN PLUTONIUM PURIFICATION CYCLES BY TRILAURYLAMINE (Methodes Analytiques Utilisees dans les Cycles de Purification due Plutonium par la Trilaurylamine),
by Jean-Jacques Perez. Aug 65, 87p Unclassified report
Rept. no. CEA-R-2860
Text in French with attached summary in English.

Descriptors: (*Plutonium, Purification), Amines, Organic compounds, Impurities, Chemical analysis, Volumetric analysis, Quantitative analysis, Colorimetric analysis, Gas analysis, Chromatographic analysis, Potentiometers, Nitrates, Sulfates, Nitric acid.

The utilization of trilaurylamine as a solvent extractant for the purification of plutonium has led to the perfection of a set of analytical methods which involves various techniques. The organic impurities of the solvent can be titrated by gas-liquid chromatography. The titration of the main degradation product, the dilaurylamine, can be accomplished also by spectrocolorimetry. Potentiometry is used for the analysis of the different salts of aminenitrate-sulfate-bisulfate as also the extracted nitric acid. The determination of the nitrate in aqueous phase is carried out by constant current potentiometry. The range of application, the accuracy and the procedure of these analysis are related in the present report. (Author)

PB-168 353 Field 7E
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
COMPUTER PROCESSING OF GAMMA SPECTRA. APPLICATION TO THE DOSAGE OF MIXED NATURAL OR ARTIFICIAL RADIOELEMENTS (Traitement par Ordinateur des Spectres Gamma. Application au Dosage de Melanges de Radioelements Naturels ou Artificiels),
by Rene Coulomb, Marcel Goldztein, and Jean-Claude Schiltz. Aug 65, 70p Unclassified report
Rept. no. CEA-R-2850
Text in French with attached summary in English.

Descriptors: (*Gamma-ray spectra, Programming-(Computers)), Radioactivation analysis, Radiochemistry, Radioactive series, Measurement, Least squares method, Programming languages.

A program, written in Fortran II for IBM 7094 II, permitting resolution by means of least squares of a mixture of natural or artificial radioelements, is described. The spectra are processed in measurement batches, making up a homogeneous study, which comprise standards and samples. This highly versatile may either ensure the processing of a great number of daily analyses, or maybe used pending development of radiochemical methods. The feeding of data has been simplified as much as possible. On the contrary, at the outlet, the numerical or graphical controls, error computations, and the printing of results in clear and legible form have been multiplied. In spite of this, the calculation times are exceedingly short. Several independent studies which include about sixty spectra may be processed in less than five minutes. (Author)

PB-168 370 Field 7D, 20M, 21I
CFSTI Prices: HC$10.00 MF$3.50

Dow Chemical Co., Midland, Mich. Thermal Research Lab.
JANAF THERMOCHEMICAL TABLES,
Rept. on Proj. PRINCIPIA,
by D. R. Stull, J. Chao, L. A. du Plessis, T. E. Dergazarian, and S. T. Hadden. Aug 65, 945p
Contract AF04 611 7554
Unclassified report

Descriptors: (*Thermochemistry, Tables), (*Combustion products, Thermochemistry), (*Rocket propellants, Combustion products), Thermodynamics, Specific heat, Entropy, Enthalpy, Heat of formation, Chemical equilibrium.

The document is comprised of a compilation of evaluated and annotated tables of thermodynamic properties pertaining to about 820 propellant combustion products. The following values are given for each species: Heat capacity, Entropy in cal/degree/mole, free energy function in the standard state, Enthalpy in the standard state, heat of formation, standard free energy of formation, logarithm (to the base 10) of the equilibrium constant of formation. Various other thermodynamic parameters are given for the individual species where available.

PB-168 424 Field 7D, 11I, 7C
CFSTI Prices: HC$2.00 MF$0.50

Polytechnic Inst. of Brooklyn, N. Y.
TRACER STUDIES ON SYNTHETIC RESINS.
Quarterly progress rept. no. 8, 1 Aug-31 Oct 53,
by J. Steigman, J. Dux, and S. Golernter.
31 Oct 53, 29p
Contract DA36 039sc5596, Projs. DA3 99 15 022; SC32 153BO
AD 25 569
Unclassified report

Descriptors: (*Polymers, Tracers studies), (*Tracer studies, Polymers), Plastics, Plasticizers, Vapor pressure, Strontium, Radioactive isotopes, Polystyrene plastics, Viscosity, Degradation, Diffusion.

Measurements were made of diffusion coefficients of strontium ion present in solution as counterion to polystyrene sulfonic acid (I). A general theory was developed for diffusion of polyelectrolyte counterions in solution with radioactive tracers. Two samples of polystyrene sulfuric acid were used: a low mol wt material (about 1200) and a sulfonated material of about 35,000 mol wt. At 58.2% neutralization, the diffusion coefficient was fairly constant, with a slight tendency to increase with time, a result difficult to explain on the basis of present theory. On the other hand, the diffusion coefficient of the 0% neutralized material tended to decrease with time, probably because the tracer Sr ions were bound to polyions. The diffusion coefficient decreased with increasing molecular weight. An unsuccessful attempt was made to determine the amount of degradation or polymerization which was produced by sulfonating polystyrene. Data are presented on the variation with concentration of the specific viscosity of aqueous solutions of I. A specific activity of 1 mC was proposed for 0.075 moles of dimethylphthalate (II). A method is indicated for preventing adsorption of II on the walls of the counting tube. (See also AD-16 895)

SB-547 Field 7D

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
CRYOGENICS.
Price list, selective bibliography of government research repts. and translations through Jul 65.
Jul 65, 23p Unclassified report

Available free from the Clearinghouse.

Descriptors: (*Cryogenics, Bibliographies), (*Bibliographies, Cryogenics), Adhesives, Alloys, Cryopumping, Fatigue(Mechanics), Electronics, Electrical properties, Welding, Magnetic materials, Computers.

The report lists 340 reports and translations added to the CFSTI collection through July 1965. Covers research on metals and alloys for cryogenic applications; high strength alloys by cryogenic stretch forming; cryogenic adhesive evaluations; cryogenic pumping systems; cold welding in vacuum; fatigue of certain alloys at low temperatures; low temperature physics and electronics; properties of electronic and magnetic materials at cryogenic temperatures; application of cryogenics to computer technology.

TID-21236 Field 7E
CFSTI Prices: HC$4.00 MF$1.00

Stevens Inst. of Tech., Hoboken, N. J.
GAMMA-RADIATION INDUCED DECOMPOSITION OF ALKALI NITRATE CRYSTALS.
Doctoral thesis,
by Raymond G. Di Martini. 1964, 129p
Contract AT(30-1)-1824

Unclassified report

Descriptors: (*Alkali metal compounds, Radiation damage), (*Nitrates, Radiation damage).

TID-21412 Field 7C, 7D
CFSTI Prices: HC$1.00 MF$0.50

Pennsylvania State Univ., University Park. Dept. of Chemistry.
STABILITIES OF COORDINATION COMPOUNDS.
Progress rept. 1 Sep 60-31 Aug 61.
1961, 5p
Contract AT(30-1)-907

Unclassified report

Descriptors: (*Complex compounds, Stability), (*Amines, Complex compounds).

TID-21610 Field 7C
CFSTI Prices: HC$3.00 MF$0.75

Fordham Univ., New York.
THE STUDY OF URANYL NITRATE-UREA COMPLEXES PREPARED BY SOLID-SOLID INTERACTION AND FROM SOLUTION.
Doctoral thesis,
by Louis S. Campisi. 1965, 90p
Contract AT30-1-906

Unclassified report

Descriptors: (*Uranyl compounds, Nitrates), (*Urea, Complex compounds).

TID-21622 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Utah Univ., Salt Lake City. Inst. of Metals and Explosives Research.
A STUDY OF A NEW THORIUM COMPOUND AT LOW PH.
Technical repot no. 24,
by Eyong D. Chun and Milton E. Wadsworth.
1 Dec 64, 12p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Thorium compounds, Chemical properties), (*Oxychlorides, Thorium compounds).

TID-21648 Field 7B, 7D
CFSTI Prices: HC$3.00 MF$0.75

Lehigh Univ., Bethlehem, Pa.
MASS SPECTROMETRIC STUDY OF LABELED NITROUS OXIDE N15N140.
Master's thesis,
by Chia Ting Chen. 1965, 72p
Contract AT(30-1)-2772

Unclassified report

Descriptors: (*Nitrogen compounds, Mass spectrum).

TID-21650 Field 7E
CFSTI Prices: HC$4.00 MF$1.00

Lehigh Univ., Bethlehem, Pa.
THE PHOTOCHEMISTRY OF LIQUID CARBON TETRACHLORIDE.
Master's thesis,
by Herbert B. Silber. 1964, 130p
Contract AT(30-1)-2772

Unclassified report

Descriptors: (*Carbon tetrachloride, Photochemistry).

WAPD-T-1760 Field 7C, 7D
CFSTI Prices: HC$1.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
THE RAMAN SPECTRUM OF ZIRCONIUM OXIDE,
by C. J. Emert and S. Milani. Feb 65, 7p
Contract AT-11-1-GEN-14

Unclassified report

Descriptors: (*Zirconium compounds, Oxides), (*Raman spectroscopy, Zirconium compounds).

08. Earth Sciences and Oceanography

AD-428 301 Field 8E, 22C, 22B
CFSTI Price: HC$1.00

Ballistic Research Labs., Aberdeen Proving Ground, Md.
POSITION PREDICTION FOR ACQUISITION IN SATELLITE GEODESY,
by R. B. Patton, Jr. Aug 63, 22p
Rept. no. BRL-1219
Proj. 1E2502060240

Unclassified report

Descriptors: (*Astronomical geodesics, Satellites-(Artificial)), (*Satellites(Artificial), Astronomical geodesics), (*Position finding, Satellites(Artificial)), Optical tracking, Ballistic cameras, Photographic techniques, Orbital trajectories, Mathematical prediction, Photogrammetry.

In its search for greater accuracy in geodetic measurement, the Coast and Geodetic Survey is conducting a program in satellite geodesy. This is a method of spatial triangulation which requires photographic observation of an identified satellite at three or more points on the earth's surface. For several months, a field unit from the Coast and Geodetic Survey has been operating a Wild BC-4 Camera System at Aberdeen Proving Ground. Successful tracking, both now and later, requires an effective method of acquiring satellites in the field of view of the camera. SPADATS orbital parameters, published by NORAD, Ent AFB, have been used to predict the position of satellites relative to the APG tracking

station site. These predictions have provided a very reliable means of acquisition. The computing method for converting the orbital parameters to position as a function of time is presented in detail. In addition, methods are described for estimating the amount of sunlight that is expected to be reflected to tracking stations by passive satellites such as ECHO. (Author)

NVO-98-3 Field 8J, 13J
CFSTI Prices: HC$3.00 MF$0.75

National Marine Consultants Div., Interstate Electronics Corp., Anaheim, Calif.
FINAL PROGRESS REPORT. TASK II.
Technical rept.
Dec 64, 93p
Contract AT(26-1)-98
Unclassified report

Descriptors: (*Oceanographic equipment, Buoys), (*Marine engineering, Oceanographic equipment).

NVO-98-4 Field 8J, 13J
CFSTI Prices: HC$3.00 MF$0.75

National Marine Consultants Div., Interstate Electronics Corp., Anaheim, Calif.
FINAL PROGRESS REPORT, TASK III.
Technical rept.
Dec 64, 67p
Contract AT(26-1)-98
Unclassified report

Descriptors: (*Oceanographic equipment, Buoys), (*Marine engineering, Oceanographic equipment).

NVO-1163-16 Field 8K
CFSTI Prices: HC$1.00 MF$0.50

Beers (Roland F.), Inc., Alexandria, Va.
PREDICTIONS OF PEAK VALUES OF GROUND MOTION.
3 Mar 64, 11p
Contract AT(29-2)-1163
Unclassified report

Descriptors: (*Seismology, Explosion effects), (*Explosion effects, Seismology).

NVO-1163-24 Field 8K
CFSTI Prices: HC$2.00 MF$0.50

Beers (Roland F.), Ind., Alexandria, Va.
GROUND MOTION PREDICTIONS, PAHUTE MESA,
by L. B. Luhrs. 9 Jun 64, 28p
Contract AT(29-2)-1163
Unclassified report

Descriptors: (*Seismology, Explosion effects), (*Explosion effects, Seismology).

NYO-1669-10 Field 8D, 8G
CFSTI Prices: HC$6.00 MF$1.25

Lamont Geological Observatory, Palisades, N. Y.
INVESTIGATIONS IN ISOTOPIC GEOCHEMISTRY.
Annual progress rept. no. 10,
by J. Laurence Kulp. Jan 65, 201p
Contract AT(30-1)-1669
Unclassified report

Descriptors: (*Geochemistry, Isotopes), (*Petrology, Geochemistry).

NYO-3145-1 Field 8A
CFSTI Prices: HC$3.00 MF$0.75

Woods Hole Oceanographic Institution, Mass.
ZOOPLANKTON DISTRIBUTION AND ISOTOPE TURNOVER DURING OPERATION SWORDFISH.
Technical rept.,
by Edward J. Kuenzler. Feb 65, 68p REF-65-5
Contract AT(30-1)-3145 Unclassified report

Descriptors: (*Plankton, Ecology).

PB-168 328 Field 8J
CFSTI Prices: HC$6.00 MF$1.25

Woods Hole Oceanographic Institution, Mass.
OCEANOGRAPHIC OBSERVATIONS, 1962, EAST COAST OF THE UNITED STATES.
Data rept.,
by Joseph Chase. Jun 65, 229p
Contracts 14 17 0007 9, 14 17 0007 45
FWS DR-9 Unclassified report

Descriptors: (*Oceanology, Atlantic Ocean), (*Atlantic Ocean, Oceanographic data), Seacoast, United States, Seawater, Temperature, Salinity, Tables.

Daily water temperature and salinity observations for 1962 from 17 locations along the Atlantic seaboard are tabulated, plotted, and discussed.

PB-168 482 Field 8J
CFSTI Prices: HC$4.00 MF$0.75

Florida State Univ., Tallahassee. Sedimentological Research Lab.
RATES OF SEDIMENTATION IN THE DRAKE PASSAGE.
Doctoral thesis,
by Charles Ward Holmes. Aug 65, 108p
Grant NSF GA40 Unclassified report

Descriptors: (*Sedimentation, Oceans), (*Marine geology, Sedimentation), (*Stratigraphy, Marine geology), Thorium, Radioactive series, Geologic age determination, Ocean bottom sampling, Polar regions, Oceanology.

Previous sedimentation rate determinations on deep sea sediments by the thorium-230/thorium-232 method have been based on leaching of the thorium isotopes from absorbed sites on clays. This investigation suggests that carbonate foraminiferal oozes contain appreciable allogenic thorium-232 and excess thorium-230 which permits sedimentation rate determinations involving complete solution of a sample 'cleaned' of extraneous material. Examination of piston cores raised from the Drake Passage exhibit alternation of carbonate-rich layers with silty-clay carbonate-poor layers. Evidence suggests that the carbonate layers were deposited during times of glacial maxima. The measured Th(230)/Th-(232) ratio in the carbonate material exposed in the Drake Passage is constant from core site to core site within acceptable error. By assuming this ratio to have been constant during the times of carbonate deposition and equal to the measured surface ratio, correlation and age calculations can be made on the carbonate layers. Analysis of the ratios in 175 samples demonstrates three periods of high carbonate productivity: more may be present but not reached in the cores studied. (Author)

PB-168 491 Field 8A, 6C
CFSTI Prices: HC$4.00 MF$0.75

Biological Sciences Communication Project, George Washington Univ., Washington, D. C.
AQUATIC BIOLOGY SERIALS-THEIR LOCATION AND CHARACTERISTICS.

Communique,
by Charles W. Shilling and Mildred Benton. Aug 64,
114p BSCP-18-64
Contract Nonr170300; Grant NIH GM11711 01
Unclassified report

Descriptors: (*Marine biology, Information retrieval), Indexes, Bibliographies, Libraries, Periodicals, Subject indexing, Aquatic animals, Fishes, Plankton, Mollusca, Arthropods, Algae, Ecology, Cetacea, Reptiles, Amphibians, Fungi.

RME-4551 Field 8I, 8G
CFSTI Prices: HC$2.00 MF$0.75

Division of Raw Materials, (AEC), Washington, D. C.
VILCABAMBA URANIUM DEPOSITS, CUZCO DEPARTMENT, PERU,
by John W. Gabelman. Oct 62, 28p
Unclassified report

Descriptors: (*Uranium, Peru), (*Economic geology, Uranium).

TID-21522 Field 8D, 8G
CFSTI Prices: HC$2.00 MF$0.50

Lamont Geological Observatory, Palisades, N. Y.
THE GEOCHEMISTRY OF PROTACTINIUM-231 AND THE DATING OF PELAGIC SEDIMENTS.
Annual rept., Appendix A,
by William M. Sackett, Wallace S. Broecker, and David L. Thurber. Feb 65, 49p
Contract AT(30-1)-3139
Unclassified report

Descriptors: (*Geochemistry, Protactinium), (*Protactinium, Geochemistry).

09. Electronics and Electrical Engineering

AD-451 256 Field 9A, 9E
CFSTI Prices: HC$2.00

Clevite Corp., Cleveland, Ohio. Electronic Research Div.
HYBRID PIEZOELECTRIC DEVICES.
Quarterly progress rept. no. 1, 15 May-15 Aug 64,
by A. D. Waren, W. J. Gerber, and D. R. Curran.
18 Sep 64, 35p Rept. no. 30
Contract DA28 043AMC00079E,
Projs. 1G6 22001A047, 303220
Unclassified report

Descriptors: (*Band-pass filters, Piezoelectric crystals), (*Quartz resonator, Piezoelectric crystals), (*Piezoelectric crystals, Band-pass filters), Electric filters, Theory, Mathematical analysis, Electrical networks, Quartz resonators, Wiring diagrams, Design.

A brief survey of the two main analytical techniques for the design of electrical filters is presented. These are image parameter and insertion loss techniques. Butterworth, Chebychev and elliptic functions are described as design techniques and a simple example is presented. The results of a first effort to obtain correlation between a computer plotted theoretical plot and a measured plot of a two section cascaded half lattice filter are given. Some of the problems connected with the fabrication of filters using the Uni-Wafer concept are discussed.

AD-457 069 Field 9A, 9E
CFSTI Prices: HC$2.00

Clevite Corp., Cleveland, Ohio. Electronic Research Div.
HYBRID PIEZOELECTRIC DEVICES.
Quarterly rept. no. 2, 16 Aug-15 Nov 64,
by A. D. Waren, W. J. Gerber, and D. R. Curran.
16 Dec 64, 36p Rept. no. 31
Contract DA28 043AMC00079E, Proj. 1G6 22001A057, 303220
Unclassified report

Descriptors: (*Band-pass filters, Piezoelectric crystals), (*Quartz resonators, Piezoelectric crystals), (*Piezoelectric crystals, Band-pass filters), Manufacturing methods, Tests, Theory, Mathematical analysis, Quartz reconators, Wiring diagrams, Electric filters, Design.

Some of the problems of quartz Uni-Wafer filter fabrication are discussed. A 10 Mc ladder filter was designed and fabricated. The experimental insertion loss characteristic is compared with a computer programmed theoretical analysis using measured resonator parameters. The significance of using the R/L ratio in place of Qm to describe resonator performance is discussed and theoretical insertion loss curves are presented to support the argument. The possibilities of using a refined iterative technique as an aid to synthesizing optimum filters is described briefly. (Author)

AD-460 377 Field 9A
CFSTI Prices: HC$8.20

Magnavox Co., Fort Wayne, Ind. Government and Industrial Div.
QUARTZ CRYSTAL OSCILLATOR CIRCUITS DESIGN HANDBOOK,
by D. Firth. 15 Nar 65, 519p Serial no. TP-64-1072
Contract DA36 039AMC00043E, Proj. DA 3A99 15 004
Unclassified report

Descriptors: (*Quartz, Crystal oscillators), (*Crystal oscillators, Handbooks), (*Handbooks, Crystal oscillators), Quartz resonators, Very high frequency, High frequency, Medium frequency, Very low frequency, Extremely low frequency, Costs, Electrical properties, Transistor amplifiers, Electron tubes, Amplifiers, Impedance maching, Experimental data, Wiring diagrams, Equations, Transistors, Voltage.

The object of this handbook is to assemble a set of design methods for crystal oscillators in the frequency range of 1 KC to 200 MC with the aim of facilitating design, eliminating crystal unit misapplications, and reducing design costs. The handbook is not directed at the design of ultra-stable crystal oscillators, but rather at the non-temperature controlled, medium frequency stability oscillator commonly in use in many types of communications equipment. The handbook contains discussions of : (1) The electrical characteristrics of crystal units, conditions of usage, and methods of measurement. (2) Characteristics of tube and transistor amplifiers. (3) Characteristics of impedance transforming networks. (4) Detailed design information on series resonance and anti-resonance oscillators. (5) Design examples together with experimental evaluation data covering most of the 1 KC to 200 MC range. (Author)

AD-463 225 Field 9A, 9E
CFSTI Prices: HC$2.00

Clevite Corp., Cleveland, Ohio. Electronic Research Div.
HYBRID PIEZOELECTRIC DEVICES.
Quarterly rept. no. 3, 16 Nov 64-15 Feb 65,
by A. D. Waren and W. J. Gerber. 19 Mar 65, 37p
Contract DA28 043AMC00079E, Projs. 1P6 22001A057, 303220

Unclassified report

Descriptors: (*Band-pass filters, Piezoelectric crystals), (*Quartz resonators, Piezoectric crystals), (*Piezoelectric crystals, Band-pass filters), Manufacturing methods, Tests, Theory, Quartz resonators, Wiring diagrams, Electric filters.

A twelve resonator cascaded half-lattice filter was fabricated in the conventional manner with one resonator per quartz wafer. Insertion loss curves showing good agreement between measured and theoretical values are presented. Some of the problems encountered during evaporation tuning of multi-resonator quartz Uni-Wafer filters are discussed. Some effort was devoted to determining a satisfactory package for Uni-Wafer filters and a simple half-lattice filter was packaged in a facsimile of a transistor TO type package. A computer routine has been developed that will calculate and plot the insertion loss of a cascaded lattice filter of up to eight sections with as many as five resonators in each lattice arm. Some of the problems and possible solutions for computing the minimum of a function of one variable and of n variables are discussed. (Author)

N65-20615 Field 9E
CFSTI Prices: HC$2.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
PRELIMINARY REPORT ON PARABOLOIDAL REFLECTOR ANTENNA WIND TUNNEL TESTS,
by Norman L. Fox and Bain Dayman, Jr.
28 Feb 62, 47p JPL-IM-CP-3
NASA CR-57572

Unclassified report

Descriptors: (*Parabolic antennas, Aerodynamic loading).

N65-20616 Field 9E
CFSTI Prices: HC$3.00 MF$0.75

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
LOAD DISTRIBUTIONS ON THE SURFACE OF PARABOLOIDAL REFLECTOR ANTENNAS,
by Norman L. Fox. Jul 62, 58p JPL-IM-CP-4
NASA CR-57559

Unclassified report

Descriptors: (*Parabolic antennas, Load distribution).

N65-20651 Field 9C, 18H
CFSTI Prices: HC$4.00 MF$1.00

Battelle Memorial Inst., Columbus, Ohio.
THE REVISED TEST PROCEDURE FOR JPL TEST NO. 617, PHASE II TO JET PROPULSION LABORATORY.
Final rept.,
by C. L. Hanks and D. J. Hamman. 25 Jan 65, 124p
Contracts NAS7-100, JPL-950458
NASA CR-57545

Unclassified report

Descriptors: (*Electronic equipment, Radiation damage), (*Radiation damage, Electronic equipment).

N65-23167 Field 9A, 21C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
CHARACTERISTICS OF A 5-KILOJOULE, IGNITRON-SWITCHED, FAST-CAPACITOR BANK,
by Charles J. Michels and Fred F. Terdan.
May 65, 22p NASA-TN-D-2808

Unclassified report

Descriptors: (*Capacitors, Half-wave rectifiers), (*Plasma engines, Capacitors).

N65-23213 Field 9A
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Syracuse, N. Y. Semiconductor Products Dept.
RESEARCH TO DETERMINE FAILURE MODES FOR TRANSISTORS.
Quarterly rept. no. 5 for Sep-Dec 1964,
by Robert G. Quick. 1964, 79p
Contract NAS8-11059
NASA CR-62505

Unclassified report

Descriptors: (*Transistors, Reliability(Electronics)), (*Reliability(Electronics), Transistors).

N65-23289 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Electric Corp., Lima, Ohio.
Aerospace Electrical Div.
BRUSHLESS D.C. TORQUE MOTOR.
Quarterly rept. no. 3, 25 Dec 64-25 Mar 65,
by W. W. Yates and R. E. Skamfer. 1965, 17p
WAED-65-21E
Contract NAS5-3934
NASA CR-62643

Unclassified report

Descriptors: (*Electric motors, Torque), Direct current.

N65-23328 Field 9D
CFSTI Prices: HC$1.00 MF$0.50

University of Southern Calif., Los Angeles.
Dept. of Electrical Engineering.
DIGITAL TECHNIQUES AND LONG-RANGE COMMUNICATION STUDY PROGRAM.
Final rept.,
by S. W. Golomb. 1965, 11p USCEE-116
Contracts NAS7-100, UPS-950729
NASA CR-62633

Unclassified report

Descriptors: (*Communication theory, Digital systems).

N65-26252 Field 9B, 20C, 20A
CFSTI Prices: HC$2.00 MF$0.50

General Dynamics Electronics, Rochester, N. Y.
RESEARCH ON A FERROACOUSTIC INFORMATION STORAGE SYSTEM,
by J. W. Gratian and R. W. Freytag. Jun 65, 37p
Contract NASw592
NASA CR-249

Unclassified report

Descriptors: (*Data storage systems, Ferromagnetic materials), (*Ferromagnetic materials, Data storage systems).

NAA-SR-MEMO-10386 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
EFFECT OF MERCURY VAPOR ON THE OPERATION OF CARTRIDGE HEATERS IN VACUO,
by R. Blevitt and G. D. Reynolds. 28 Aug 64, 13p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Heaters, Operation), (*Mercury, Vapors).

ORNL-TM-1037 Field 9B, 12A
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SOLUTION OF SIMULTANEOUS LINEAR EQUATIONS WITH 1604 SUBROUTINE MAT,
by C. W. Nestor, Jr. 15 Jan 65, 10p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Programming(Computers), Matrix algebra), (*Matrix algebra, Programming(Computers)).

Patent 3,198,955 Field 9B

BINARY MAGNETIC MEMORY DEVICE.
Patent assigned to NASA,
by David H. Schaefer. 3 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Magnetic core storage, Binary arithmetic), (*Binary arithmetic, Magnetic core storage), Computer storage devices, Digital systems, Computer logic, Patents.

The nondestructive readout circuit is for determining the remanent magnetic state of a magnetic binary element without permanently destroying the information stored by the magnetic element. The circuit includes input and output terminals, a toroidal coil, a transistor switch, two diodes, two resistors and a storage capacitor.

Patent 3,199,024 Field 9C

APPARATUS AND METHOD FOR DETERMINING THE IMPEDANCE OF A COMPONENT IN A COMPLEX NETWORK WITHOUT REMOVING THE COMPONENT FROM THE NETWORK.
Patent assigned to Army,
by Ron Manly and William G. Miller. 3 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Impedance bridges, Radiofrequency), Measuring devices(Electrical + electronic), Impedance matching, Electrical impedance, Networks, Patents.

The apparatus is for measuring the current in a component of a complex network. The circuitry includes a calibrated current generator, a switch with contacts, a microvoltmeter and a voltmeter.

Patent 3,199,040 Field 9A, 9C

CRYSTAL FREQUENCY DISCRIMINATOR.
Patent assigned to Navy,
by James E. Coogan. 3 Aug 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Discriminators, Frequency), (*Frequency, Discriminators), Crystals, Frequency converters, Resonators, Capacitors, Resistors, Diodes, Potentiometers, Circuits, Patents.

The crystal frequency discriminator is used in an FM transmitter. The circuitry includes an input, an isolation capacitor, an inductor, two crystal resonators, two load resistors, two diodes, four capacitors, including two storage capacitors, two resistors, a potentiometer, and an output.

Patent 3,199,069 Field 9C, 20A, 20F

ACOUSTICAL-TO-OPTICAL IMAGE CONVERTER.
Patent assigned to Navy,
by John B. Lord and Victor Harris. 3 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Sound signals, Images), (*Television display systems, Sound signals), Acoustics, Modulation, Light, Non-destructive testing, Patents.

The system is for viewing objects in nontransparent media. It may be used for the inspection of imperfections on a manufacturing production line and for searching for objects in turbid water. The system allows the use of a low energy sound signal to modulate a high energy light beam, thus providing signal gain. The image viewing occurs simultaneously across the entire image area, which is in contradistinction to viewing by linear scan as is true of some prior art systems. By doing away with the necessity of linear scan, all incoming acoustic energy may be utilized so that the efficiency of the system is greatly increased. (Author)

Patent 3,199,939 Field 9A, 11C

PHOSPHOR DEPOSITION.
Patent assigned to AEC,
by Herman A. Stern. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Cathode-ray tubes, Coatings), (*Phosphorescent materials, Distribution), Image tubes, Discharge tubes, Evaporation, Patents.

The method relates to the deposition of phosphor compounds in the manufacture of ray-sensitive tubes. The deposition is accomplished after tube exhaust. The method includes the use of one or more evaporator boats permanently secured within an envelope the contents of which may be 'flashed' after bakeout and exhaust. The 'flashing' may be done before or after the sealing-off step, of conventional tube processing, is performed. The phosphor evaporator boats may be arranged to deposit the phosphor on selected areas of a substrate.

Patent 3,200,260 Field 9E

HIGH CURRENT LEVEL INTERRUPTER MEANS.
Patent assigned to Navy,
by Bert Fisk, Morton Fischman and Theodore J. Rauen.
10 Aug 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Interrupters, Teletype systems), Semiconductor devices, Radiofrequency interference, Attenuation, Patents.

The device is adaptable to teleprinter equipment, electric typewriters, signaling relays and the like. It produces a minimum amount of radio frequency interference. The device embodies transistor circuitry and is adaptable to space satellite applications.

Patent 3,200,401 Field 9E

PHASE SCAN ANTENNA SYSTEM.
Patent assigned to Navy,
by Robert L. Conger, Robert F. Riggs, Dale B. Kern and Charles E. White. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Phased arrays, Dielectrics), Patents, Scanning, Phase shift, Phase shifters, Rods, Antenna components, Antenna feeds, Helixes, Signals.

The system uses an array of dielectric rod antenna elements, with both scan and non-scan signals being obtained from the same antenna by use of an output divider in conjunction with each antenna element. The system is for operational use over a large dynamic range.

Patent 3,200,668 Field 9C, 13J

ELECTRO-MAGNETIC ACTUATOR.
Patent assigned to Navy,
by Charles F. Janes. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Waveform generators, Electromagnetic drives), (*Electromagnetic drives, Waveform generators), Patents, Rotation, Solenoids, Gears, Generators, Electromagnetic waves, Underwater propulsion.

The electro-magnetic wave generator is particularly adapted for creating a rotating wave in the flexible ring gear of a harmonic drive device. One application of the harmonic drive as a speed reducer is in propelling small, deep diving research submarines. The device includes a flexspline, an outer spline member and a plurality of elelctrically connected solenoids driving the flexspline. The flexspline is made of an elastic material and has teeth along its outer periphery. The outer spline member has internal teeth which are greater in number than the teeth on the flexspline. The teeth on the flexspline and outer spline are forced into camming engagement when the flexspline is deformed to produce relative movement there between.

Patent 3,201,296 Field 9E

METHOD OF MAKING A WAVEGUIDE WINDOW.
Patent assigned to Army,
by Timothy J. Kilduff and Asaf A. Benderly. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Waveguide windows, Polythylene plastics), Patents, Films, Bonding, Adhesives, Epoxy plastics, Standing wave ratios, Aluminum, Brass.

A polytetrafluoroethylene film is treated in a sodium-napthalene bath to render it cementable and is then bonded to aluminum or brass waveguide flanges with a high-temperature-resistant adhesive containing epoxy resin and solvent. The film so bonded provides a waveguide window. Windows so assembled have successfully withstood pressures of about 20 p.s.i.g. at a temperature of 125 degrees C. (257 degrees F.) for 15 minutes and have provided a voltage standing wave ratio (VSWR) no greater than 1.08 when measured within a particular test-frequency band.

Patent 3,201,607 Field 9A

ELECTRONIC SWITCHING CIRCUIT.
Patent assigned to Navy,
by John G. Richer. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Switching circuits, Gates(Circuits)), (*Gates(Circuits), Switching circuits), Patents, Transformers, Resistors.

The gating circuit may be operated in either a normally transmitting mode or in a normally non-transmitting mode. The circuit includes a bridge network consisting of four diodes, signal inputs and outputs, a pair of pulse transformers and a damping resistor.

Patent 3,201,621 Field 9A

THERMALLY STABILIZED CRYSTAL UNITS.
Patent assigned to Navy,
by Consuelo S. milner.
17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Frequency stabilizers, Oscillators), (*Oscillators, Frequency stabilizers), Piezoelectric crystals, Heating elements, Temperature sensitive elements, Patents.

The crystal unit is used in controlling the frequency of an oscillator. The structure includes a horseshoe-shaped heating electrode, a source of energy, and a temperature sensitive resistance for sensing the temperature of the crystal. The elements are so connected that the resistance varies the heating.

Patent 3,201,722 Field 9C

TRANSMISSION LINE ADAPTER FOR CONNECTING COAXIAL AND STRIP TRANSMISSION LINES AT RIGHT ANGLES.
Patent assigned to Navy,
by Charles B. May and Richard D. Jeffery. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Transmission lines, Electric connectors), (*Electric connectors, Adapters), (*Adapters, Electric connectors), Coaxial cables, Impedance matching, Electrical engineering, Patents.

The electrical connector unit is for joining a coaxial line to a transmission line of the 'strip' type. An adaptor is provided by which an essentially flat voltage standing wave ratio is maintained over a relatively wide band of frequencies.

Patent 3,201,764 Field 9E, 9B

LIGHT CONTROLLED ELECTRONIC MATRIX SWITCH.
Patent assigned to Navy,
by Carlyle V. Parker. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Electronic switches, Data transmission systems), Data, Signals, Control, Semiconductor devices, Photoelectric effect, Diodes, Light, Patents.

The all electronic light-controlled matrix network provides permutation changes as the radix is changed to binary. It is designed for use with space and satellite apparatus. The signal network provides a permuation and radix change in a single matrix without the use of mechanical (metal-to-metal) contacts for making connections. All connections are made simultaneously by a single action.

Patent 3,202,846 Field 9A

PIEZOELECTRIC CRYSTAL ELEMENT.
Patent assigned to Army,
by Arthur D. Ballato and Rudolf Bechmann.
24 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Piezoelectric crystals, Crystal filters), Patents, Quartz, Electrodes, Resonance.

The electroded piezoelectric quartz elements are used as circuit elements in crystal filter systems. The crystal element is cut from the mother quartz in a specific manner. A pair of electrodes utilized for parallel field excitation are mounted on a major surface of the element.

Patent 3,202,997 Field 9E

SCANNING CORNER ARRAY ANTENNA.
Patent assigned to Air Force,
by Allan C. Schell. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Antenna configurations, Scanning), Antenna feeds, Reflectors, Dipole antennas, Ultrahigh frequency.

A corner reflector antenna is shown in combination with a plurality of dipole feed elements. The elements are disposed within the corner in parellelism along a series of planes having a common access of intersection at the corner. They are adapted to divert the beam produced thereby in response to the several currents applied to each of the feed elements.

PB-168 204 Field 9B, 5I
CFSTI Prices: HC$2.00 MF$0.50

California Inst. of Tech., Pasadena. Computing Center.

AN INTEGRATED COMPUTER SYSTEM CONCEPT FOR RESEARCH AND EDUCATION.
Technical rept.,
by G. D. McCann, K. J. Hebert, and C. B. Ray.
Mar 64, 35p Rept. no. TR-125
Unclassified report
Grant NSF G483

Descriptors: (*Digital computers, Universities), Data processing systems, Programming(Computers), Special purpose computers, Data storage systems, Experimental data, Scientific research, Programming languages, Control systems, Education, Tests.

The California Institute of Technology Computing Center has been engaged in the development of a system concept which will permit interplexed operations from a large number of remote input-output stations and peripheral special purpose data processors. The work has been directed toward the following three general classes of applications: (1) production computing and compiling with fast turn around; (2) direct data collection and on-line control analysis for large-scale experimental research; and (3) creative programming efforts of individuals at their optimum thought process rate and interacting directly with the computer. The performance of these functions at remote locations from the central computing system has been achieved by the development of a basic remote typewriter console suitable for human communication with the computer, a standard form of remote display and a series of special purpose data collection and peripheral processing stations.

PB-168 257 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Burroughs Corp., Radnor, Pa. Radnor Div.
AQ-44 RADIO TEST SET AN/URM-30.
Instrument calibration procedure technical manual.
1 May 65, 13p
Contract N123 62861 51297A
NAVWEPS 17-20AQ44
Unclassified report

Descriptors: (*Test sets, Radio equipment), (*Calibration, Test sets), Signal generators, Amplitude modulation, Very high frequency, Circuits, Voltmeters, Portable, Instruction manuals.

This procedure contains the information necessary for calibrating the AN/URM-30 Radio Test Set, herein referred to as the Test Instrument. This portable instrument requires external battery voltages of 1.25 volts at 0.2 ampere and 125 volts at 0.015 ampere. It generates amplitude-modulated rf signals at frequencies of 30.375, 121.5, and 243 megacycles. These signals are amplitude modulated at a frequency from 900 to 1500 cycles per second. The Test Instrument also contains a meter circuit which can be used for measuring ac or dc voltages from 0 to 1.5 volts and from 0 to 150 volts. (Author)

PB-168 329 Field 9E, 20C
CFSTI Prices: HC$2.00 MF$0.50

Colorado Univ., Boulder.
IMPEDANCE MEASUREMENTS ON A MODEL OF AN ELECTRICALLY SHORT VERTICAL MONOPOLE ANTENNA OVER A RADIAL WIRE GROUND SYSTEM ON AN IMPERFECTLY CONDUCTING EARTH.
Master's thesis,
by Robert Arnold Stute. 1965, 49p
Contract CST7571
Unclassified report

Descriptors: (*Electrical impedance, Antennas), (*Antennas, Electrical impedance), Ground(Electrical), Antenna configurations, Model tests, Conductivity.

This thesis is concerned with the measurement of the change in impedance of an electrically short monopole antenna (less than 0.1 wavelength) with a radial wire ground system over an imperfectly conducting earth with respect to the same antenna over an infinite perfectly conducting ground. The measurements seek to verify the results of a theoretical formulation due to Wait and Pope. Modeling techniques were used in the measurements with a solution of sodium chloride and water used to model the imperfectly conducting earth. Since there are no reliable tabulated values of impedance for the electrically short monopoles over a perfectly conducting ground, these values were determined experimentally using a 3.86 wavelength diameter copper disk as the perfectly conducting ground. In both instances, standing wave ratio measurement techniques coupled with the Smith chart were employed to find the impedances. For the radial wire ground system, the impedance was found as a function of the monopole height and the length and number of radials. The results showed some correspondence with theoretically predicted impedance changes due to Maley, King and Branch based on the theory of Wait and Pope. The general trend of decreasing impedance with increases in number or length of the radials was verified but specific values were quite different. The resistance changes were closer to theory than those of the reactance.

PB-168 333 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Burroughs Corp., Radnor, Pa. Radnor Div.
GP-09 RADIO FREQUENCY POWER TEST SET AN/USM-68.
Instrument calibration procedure technical manual.
15 Apr 65, 25p
Contract N123 62861 35057A
NAVWEPS 17-20GP09

Unclassified report

Descriptors: (*Test sets, Radiofrequency power), (*Calibration, Test sets), Ultrahigh frequency, Microwave frequency, Frequency meters, Portable, Instruction manuals.

This procedure contains the information necessary for calibrating the AN/USM-68 Radio Frequency Power Test Set. This portable test unit is used to measure the power level of radio frequency output from either continuous-wave, modulated, or pulsed sources. It is designed for measurements at frequencies from 500 to 11,000 megacycles and at power levels from 100 microwatts to 5 watts.

PB-168 443 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Boeing Co., Seattle, Wash. Aero-Space Div.
VOLTAGE DIVIDER TS-265/UP.
Technical manual instrument calibration procedure, AN-09.
15 Jun 65, 9p
Contract N123 62861 35056A
NAVWEPS 17-20AN-09

Unclassified report

Descriptors: (*Voltage dividers, Calibration), (*Test equipment(Electronics), Calibration), Video signals, Instruction manuals, Test methods.

The manual describes the calibration procedure for the TS-265/UP Voltage Divider. The Test Instrument is a portable, general purpose, self contained unit designed to step down high video pulse voltages so they may be observed on a standard oscilloscope. (Author)

PB-168 444 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Boeing Co., Seattle, Wash. Aero-Space Div.
MICROWAVE CRYSTAL TEST SET TYPE 390 AND 391 (AIRBORNE INSTRUMENTS LABORATORY).
Technical manual instrument calibration procedure, AY-15.
15 Jun 65, 8p
Contract N123 62861 35056A
NAVWEPS 17-20AY-15

Unclassified report

Descriptors: (*Crystals, Microwave equipment), (*Microwave equipment, Calibration), Test equipment-(Electronics), Instruction manuals, Test methods.

This manual describes the calibration procedure for the Airborne Instruments Laboratory, Types 390 and 391 Microwave Crystal Test Sets. The Test Instrument provides for quickly determining the performance quality of microwave crystals.

PB-168 449 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Boeing Co., Seattle, Wash. Aero-Space Div.
RF VOLTMETERS, MODELS 91B, 91C, 91CA, 91D (BOONTON ELECTRONICS CORPORATION).
Technical manual instrument calibration procedure AE-22.
1 Jun 65, 20p
Contract N123 62861 35056A
NAVWEPS 17-20AE-22

Unclassified report

Descriptors: (*Voltmeters, Calibration), (*Test equipment(Electronics), Voltmeters), Radiofrequency, Instruction manuals, Test methods.

This manual describes the calibration procedure for the Boonton Electronics Corporation Models 91B, 91C, 91CA, and 91D RF Voltmeters except when a particular model or models is referenced. In this case, the Model designation will be used. The Test Instrument is capable of measuring radio frequency voltages over a wide frequency range.

PB-168 450 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Boeing Co., Seattle, Wash. Aero-Space Div.
PULSE GENERATOR MODEL 570-A (KAY ELECTRIC RADA PULSER SR.).
Technical manual instrument calibration procedure, AG-90.
15 Jun 65, 17p
Contract N123 62861 35056A
NAVWEPS 17-20AG-90

Unclassified report

Descriptors: (*Signal generators, Microwave equipment), (*Microwave equipment, Calibration), (*Test equipment(Electronics), Signal generators), Vidio signals, Pulse generators, Test sets, Radar, Television equipment, Instruction manuals, Test methods.

The manual describes the calibration procedure for the Kay Electric Rada Pulser Sr. Model 570-A signal generator. The Test Instrument is a CW, pulsed carrier and video pulse generator, designed to be used in testing radar, TV, and other equipment.

PB-168 451 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Radnor Div., Burroughs Corp., Pa.
AC-DC CONVERTER MODEL 457A (HEWLETT-PACKARD).
Technical manual instrument calibration procedure AE-44.
1 Jun 65, 14p
Contract N123 62861 51297A
NAVWEPS 17-20AE-44

Unclassified report

Descriptors: (*Rectifiers, Calibration), (*Test equipment(Electronics), Rectifiers), Voltmeters, Instruction manuals, Test methods.

This manual contains the information necessary for calibrating the Hewlett-Packard model 457A ac-dc converter. The Test Instrument is a precision instrument which produces a dc output voltage which is between 0 and 1 volt and is proportional to the average value of the applied ac voltage. The applied ac voltage can be from 100 microvolts to 300 volts at frequencies of 50 cycles per second to 500 kilocycles. The Test Instrument permits accurate measurements of ac voltages by use of a dc voltmeter.

PB-168 455 Field 9C
CFSTI Prices: HC$3.00 MF$0.50

Bureau of Naval Weapons, Washington, D. C.
DIGITAL VOLTMETERS, OHMMETERS, AND RATIOMETERS.
Technical manual instrument calibration procedure, AE-17.
1 Jun 65, 53p Rept. no. NAVWEPS-17-20AE-17

Unclassified report

Descriptors: (*Test equipment(Electronics), Calibration), Voltmeters, Ohmeters, Multimeters, Instruction manuals, Test methods, Electronic equipment.

This is a general-coverage procedure that describes methods for calibrating three-, four-, and five-decade digital instruments that measure direct voltage, voltage ratio, alternating voltage, ohms, or a combination of these functions, to accuracies equal to or less than those listed in table 1. A list of representative instruments is included in appendix A.

SC-TM-65-63 Field 9E, 9B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
DATA FILTER CHARACTERISTICS AND EFFECTS,
by J. L. Mortley. Feb 65, 12p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Filters(Electromagnetic wave), Data processing systems).

SC-TM-65-106 Field 9A
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
GUARDED CIRCUITS,
by R. K. Treece. Mar 65, 10p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Circuits, Electrical impedance).

UCRL-13134 Field 9A
CFSTI Prices: HC$2.00 MF$0.75

Field Emission Corp., McMinnville, Oreg.
DEVELOPMENT AND MANUFACTURE OF A 2-MV FLASH X-RAY SYSTEM AND RADIOGRAP HIC TUBE.
Final rept. 1 Oct 62-30 Sep 64,
by John L. Brewster, Richard E. Anderson, Colin G. Powers, Kenneth E. Smith, and Francis M. Charbonnier. 1964, 50p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*X-ray tubes, Flash radiography), (*Flash radiography, X-ray tubes).

10. Energy Conversion (Non-propulsive)

ACNP-64501 Field 10A, 19C, 13H
CFSTI Prices: HC$6.00 MF$1.50

Allis-Chalmers Mfg. Co., Milwaukee, Wis. Atomic Energy Div.
ENERGY DEPOT SYSTEM STUDY: LIQUID HYDROGEN AND AMMONIA FUELS.
Feb 64, 243p
Contract AT(30-1)-3133

Unclassified report

Descriptors: (*Fuel cells, Hydrogen), (*Hydrogen, Fuel cells), (*Ammonia, Fuel cells).

AD-456 387 Field 10B, 10C
CFSTI Prices: HC$400

Cook Electric Co., Dayton, Ohio. Inland Testing Labs.
INVESTIGATIONS LEADING TO THE DEVELOPMENT OF THE OPTIMUM METHOD(S) FOR CHARGING SEALED NICKEL-CADMIUM BATTERIES.
Rept. no. 4 (Final) for 1 Oct 62-30 Sep 63; and Add. to Final rept. for 4 May-4 Oct 64,
by I. F. Luke and R.L. Koesters. 4 Oct 64, 119p
Contract DA36 039sc90823, Proj. DA 1C6 22001A053 N65 17467

Unclassified report

Descriptors: (*Storage batteries, Maintenance), Nickel, Cadmium, Battery charges, Batteries + components, Optimization, Voltage, Electric currents, Electric discharges, Tables, Low-temperature research, Test methods.

Experiment test data, analyses and results for investigations of constant current and constant potential charging at 125 F, 75 F, -10 F and -40 F and pulse charging at -40 F using Ce ll Types BB412 and BB440 are presented. Over the selected levels of the test variables included in the experiments, the averages of the results (Lased upon percent capacity obtained): (1) were greater with constant pocential charging at 75 F and 125 F than with constant current charging; (2) were initially greater with constant current charging at -10 F and -40 F than with constant potential charging, but were similar for the two charge methods in subsequent tests of Type BB440 cells at -10 F and slightly less with subsequent cc charging at -40 F, and in general, decreased with suceeding cycles in subsequent tests of Type BB412 cells whether charged with cc or cp; (3) following pulse charging of BB440 cells at -40 F with average four-hour rates were comparable to those with constant potential charging at -40 F. (Author)

AD-460 792 Field 10C, 11B, 11D, 11F
CFSTI Prices: HC$4.00

General Electric Co., Pleasanton, Calif. Special Purpose Nuclear Systems Operation.
RESEARCH AND DEVELOPMENT PROGRAM OF THERMIONIC CONVERSION OF HEAT TO ELECTRICITY.
Technical summary rept.
31 Dec 64, 136p Rept. no. GEST-2046
Contract NObs90496, Proj. SR007 12 01, ARPA Order 219, Task 2
Unclassified report

Descriptors: (*Thermionic converters, Nuclear power plants), (*Materials, Thermionic converters), Uranium compounds, Oxides, Refractory metals, Reaction kinetics, Diffusion, Molybdenum, Tungsten, Thermal insulation, Aluminum compounds, Niobium, Niobium alloys, Zirconium alloys, Metal seals, Ceramic materials, Bonding, Life expectancy, Tantalum, Cermets.

The objective of this program is the development of a nuclear thermionic electrical generating system for the Department of the Navy. Work under this contract is being performed to develop the materials capabilities which are essential for this nuclear thermionic system. This work consists of three major tasks. They are: UO2-refractory metal reaction kinetics, insulator materials development, ceramic-to-metal seal development.

N65-17614 Field 10B, 21E
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
INVESTIGATION OF A 4.0-INCH-MEAN-DIAMETER FOUR-STAGE REENTRY TURBINE FOR AUXILIARY POWER DRIVES,
by Robert Y. Wong, David L. Darmstadt, and Daniel E. Monroe. Mar 60, 24p NASA-TM-X-152
Unclassified report

Descriptors: (*Auxiliary power plants, Turbines), (*Turbines, Reentry vehicles), Drives.

N65-21391 Field 10A
CFSTI Prices: HC$1.00 MF$0.50

Electro-Optical Systems, Inc., Pasadena, Calif.
EVALUATION OF REGENERATIVE FUEL CELL.
Progress rept., Jan 63,
by J. J. Rowlette. 8 Feb 63, 9p EOS-3310-ML-5
Contract NAS7-181
NASA CR-62104
Unclassified report

Descriptors: (*Fuel cells, Performance(Engineering), (*Electrolytes, Fuel cells).

N65-22618 Field 10A
CFSTI Prices: HC$2.00 MF$0.50

Electro-Optical Systems, Inc., Pasadena, Calif.
HYDROGEN OXYGEN ELECTROLYTIC REGENERATIVE FUEL CELLS.
Quarterly rept. 1 Jan-31 Mar 65,
by M. Klein and E. Findl. 15 Apr 65, 39p
EOS-4110-QL-3
Contract NAS3-2781
NASA CR-54380
Unclassified report

Descriptors: (*Fuel cells, Performance(Engineering)), (*Electolytes, Fuel cells).

N65-23275 Field 10C, 22B
CFSTI Prices: HC$2.00 MF$0.50

Yardney Electric Corp., New York.
RESEARCH AND DEVELOPMENT STUDY OF THE SILVER CADMIUM COUPLE FOR SPACE APPLICATION.
Final progress rept., 1 Jul-30 Sep 1964,
by Allen Charkey and G. A. Dalin. 1964, 34p
Contract NAS5-3452 Unclassified report
NASA CR-62610

Descriptors: (*Electrodes, Electrolytic cells), Silver compounds, Cadmium, Oxides, Satellites(Artificial).

N65-26250 Field 10A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
OPERATING STABILITY OF THE APOLLO FUEL-CELL CONDENSER,
by Michael B. Weinstein. Jun 65, 22p
NASA-TM-X-1100
Unclassified report

Descriptors: (*Fuel cells, Condensers(Liquefiers)), (*Condensers(Liquefiers), Fuel cells).

N65-26260 Field 10B
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
SEEDING CRITERION FOR NONEQUILIBRIUM MAGNETOHYDRODYNAMIC GENERATORS,
by Frederic A. Lyman and Eli Reshotko.
Jun 65, 59p NASA-TN-D-2873
Unclassified report

Descriptors: (*Generators, Magnetohydrodynamics), (*Plasma medium, Additives).

N65-27818 Field 10C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
A LONG-LIFE THERMAL CELL,
by Lawrence H. Thaller. Jul 65, 16p
NASA-TN-D-2915 Unclassified report

Descriptors: (*Thermal batteries, Primary cells), (*Primary cells, Life expectancy).

N65-27947 Field 10A
CFSTI Prices: HC$3.00 MF$0.75

Hughes Aircraft Co., Culver City, Calif.
RIGIDIZED INFLATABLE SOLAR ENERGY CONCENTRATORS,
by S. Schwartz and J. Bagby. Jul 65, 82p
Contract NAS1 3244 Unclassified report
NASA CR-254

Descriptors: (*Solar radiation, Reflectors), (*Reflectors, Solar radiation).

Patent 3,198,711 Field 10B, 18D, 18J

THERMOELECTRIC NUCLEAR FUEL ELEMENT.
Patent assigned to AEC,
by James O. McPartland, Linden A. Pember and James A. Christensen. 3 Aug 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Reactor fuel elements, Thermoelectricity), (*Thermoelectricity, Reactor fuel elements), Ceramic materials, Thermocouples, Energy conversion, Patents.

The nuclear fuel element is composed of a plurality of axially aligned hollow uranium dioxide cylinders, a coil of tungsten wire embedded in vibrationally compacted uranium dioxide powder inside the uranium dioxide cylinders, a metal jacket enclosing the uranium dioxide cylinders, and a screen-grid of tungsten embedded in vibrationally compacted uranium dioxide power surrounding the uranium dioxide cylinders.

Patent 3,200,269 Field 10C

SELF CHARGING NUCLEAR BATTERY.
Patent assigned to Army,
by Melvin M. Goldstein and Harry C. Lieb.
10 Aug 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Radioactive batteries, Strontium), Radioactive isotopes, Life expectancy, Patents.

The battery is for use in the superquick, delay, or selectable electrical circuits of fuses, timers, and the like. Strontium 90 is utilized as the radioactive isotope. The battery has a shelf life of approximately 20 years.

PB-168 461 Field 10C, 18H
CFSTI Prices: HC$3.00 MF$0.75

Atomics International, Canoga Park, Calif.
THE EFFECTS OF RADIATION ON NICKEL-CADMIUM BATTERY ELECTRODES. I.
Final rept. for Jun 63-Apr 65,
by G. R. Argue, H. L. Recht, W. A. McCollum, and D. E. McKenzie. 15 Apr 65, 70p Rept. no. AI-65-66
Contracts JPL950514, NAS7-100 Unclassified report
N65 24491, NASA CR-62796

Descriptors: (*Alkaline cells, Radiation damage), (*Electrodes, Radiation damage), (*Radiation damage, Storage batteries), Nickel, Cadmium, Storage batteries, Electrochemistry, Voltage, Electrolytes, Potassium compounds, Hyroxides, Erosion, Gases, Pressure.

A study was made to determine the effects of radiation on nickel-cadmium electrodes and their magnitude. Voltage-current relationships of nickel-cadmium batteries are not affected by gamma radiation in the short run. Radiation causes the cadmium electrode to lose capacity, when undergoing charge-discharge cycling. It is thus recommended that unnecessary cycling of batteries in radiation fields be avoided. Material is dislodged from the irradiated electrodes, with the most being lost at 100 per cent of charge. This phenomenon may not be of great importance in commercial cells as their closely packed configuration appears to oppose this effect. Only two to two and one-half pounds per square inch were the highest observed pressures attained by cells in radiation fields. This effect is of little consequence, since cells are designed to retain gases up to 100 psig. (Author)

11. Materials

AD-294 804 Field 11B
CFSTI Prices: HC$3.00

New Jersey Ceramic Research Station, Rutgers - The State Univ., New Brunswick.
INORGANIC DIELECTRICS RESEARCH.
Progress rept. no. 4, 1 Aug-1 Nov 62.
1 Nov 62, 56p
Contract DA36 039sc89141
Unclassified report

See also AD-285 961.

Descriptors: (*Dielectrics, Preparation), (*Ceramic materials, Dielectrics), Ferroelectric materials, Barium compounds, Titanates, Glass, Powders, Electrical properties, Boron compounds, Nitrides, Microwave equipment, Materials, Crystallization, Aluminum compounds, Oxides, Lanthanum compounds, Silicates.

Work in the following areas is reported: preparation and properties of devitrified ferroelectric barium powders; deterioration of the electrical properties of low-loss boron nitride ceramic dielectrics; preparation of transparent polycrystalline alumina ceramics, preparation of lanthanum alumino silicate low-loss dielectrics.

AD-402 622 Field 11B
CFSTI Prices: HC$3.00

New Jersey Ceramic Research Station, Rutgers - The State Univ., New Brunswick.
INORGANIC DIELECTRIC RESEARCH.
Progress rept. no. 5, 1 Nov 62-1 Feb 63,
by E. J. Smoke, C. J. Phillips, E. L Kastenbein, D. A. Lupfer, and D. R. Ulrich. 1 Feb 63, 67p
Contract DA36 039sc89141
Unclassified report

See also AD-294 804, AD-430 912.

Descriptors: (*Dielectrics, Preparation), (*Ceramic materials, Dielectrics), (*Titanates, Dielectrics), Glass, Crystallization, Barium compounds, X-ray diffraction, Aluminum compounds, Oxides, Sintering, Spinel, Crystal structure, Microwave equipment, Materials, Aluminum compounds, Silicates, Lanthanum compounds, Magnesium compounds, Zirconates, Lead compounds, Extrusion.

Work in the following areas is reported: Devitrification of carium titanate glass; preparation of transparent polycrystalline ceramics for use as substrates for ultra-thin metallic films; development of low loss microwave dielectrics from lanthanum alumino silicate and magnesium zirconate titanate systems; hot extrusion of lead zirconate titanate and barium titanate.

AD-411 390 Field 11B
CFSTI Price: HC$4.00

New Jersey Ceramic Research Station, Rutgers - The State Univ., New Brunswick.
INORGANIC DIELECTRICS RESEARCH.
Progress rept. no. 6, 1 Feb-1 May 63,
by E. J. Smoke, C. J. Phillips, E. L. Kastenbein, D. A. Lupfer, and D. R. Ulrich. 1 May 63, 146p
Contract DA36 039sc89141
Unclassified report

Available copy will not permit fully legible reproduction.
See also AD-402 622, AD-430 912.

Descriptors: (*Dielectrics, Preparation), (*Ceramic materials, Dielectrics), (*Titanates, Dielectrics), Ferroelectric materials, Glass, Crystallization, Barium compounds, Aluminum compounds, Oxides, Sintering, Lead compounds, Zirconates, Extrusion, Microwave equipment, Materials, Electrical properties.

Work in the following areas is reported: Devitrification of ferroelectric barium titanate glass; preparation of transparent polycrystalline alumina; hot coextrusion of lead zirconate titanate and barium titanate with steel; electrical losses in solid inorganic dielectrics in the microwave region.

AD-421 801 Field 11B
CFSTI Prices: HC$4.00

New Jersey Ceramic Research Station, Rutgers - The State Univ., New Brunswick.
INORGANIC DIELECTRICS RESEARCH.
Progress rept. no. 7, 1 May-1 Aug 63,
by E. J. Smoke, C. J. Phillips, E. L. Kastenbein, D. A. Lupfer, and R. C. Pitetti. 1 Aug 63, 108p
Contract DA36 039sc89141
Unclassified report

See also AD411 380, AD-430 912.

Descriptors: (*Dielectrics, Preparation), (*Ceramic materials, Dielectrics), (*Titanates, Dielectrics), Ferroelectric materials, Glass, Barium compounds, Solutions, Flame spraying, Oxides, Lanthanum compounds, Aluminum compounds, Silicon compounds, Crystals, Magnesium compounds, Calcium compounds, Stannates, Material forming, Nitrides, Electrical properties, Additives, Microwave equipment, Materials.

Work in the following areas is reported: Dissolution of barium oxide after flame spraying barium titanate into distilled water; lanthana-alumina-silica glass as ultra-low dielectrics; crystalline titanates and stannates as low-loss microwave dielectrics; preparation of hot-pressed boron nitride and the cause for the deterioration of electrical properties therein.

AD-430 912 Field 11B
CFSTI Prices: HC$3.00

New Jersey Ceramic Research Station, Rutgers - The State Univ., New Brunswick.
INORGANIC DIELECTRICS RESEARCH.
Final rept. for 1 Nov 61-31 Oct 63,
by E. J. Smoke, C. J. Phillips, E. L. Kastenbein, D. R. Ulrich, and R. C. Pitetti. 31 Oct 63, 92p
Contract DA36 039sc89141
N64 16609
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Dielectrics, Preparation), (*Ceramic materials, Dielectrics), (*Titanates, Dielectrics), Ferroelectric materials, Glass, Powders, Barium titanates, Crystallization, Boron compounds, Nitrides, Electrical properties, Microwave equipment, Materials, Aluminum compounds, Oxides, Spinel, Crystal structure, Lanthanum compounds, Silicates, Extrusion.

Work in the following areas is reported: Devitrification of finely powdered barium titanate glass, evaluation of low-loss boron nitride dielectrics for microwave applications; crystalline phases in transparent polycrystalline alumina and spinel; development of low-loss lanthanum alumino silicate dielectrics; hot coextrusion of barium titanate and steel.

AD-451 774 Field 11I, 20C
CFSTI Prices: HC$2.00

Ballistic Research Labs., Aberdeen Proving Ground, Md.
SHOCK-INDUCED POLARIZATION OF PLEXIGLAS AND POLYSTYRENE,
by F. E. Allison and G. E. Hauver. Aug 64, 26p
Rept. no. BRL-1258
Proj. 1M14501A33E
Unclassified report

Descriptors: (*Dielectrics, Polarization), (*Acrylic resins, Polarization), (*Styrene plastics, Polarization), (*Polarization, Shock waves), Electrical properties, Pressure, Relaxation time, Phase studies, Mathematical analysis.

The theory describing the electric polarization produced in certain dielectrics by the passage of a shock front has been generalized to take account of relaxation effects. The shock-induced displacement current is described in terms of three parameters: P sub s zero, the polarization produced at the shock front; K, the dielectric constant of the shocked material; and tan, a relaxation time. Values of P sub s zero, K', and tau have been obtained experimentally for Plexiglas and polystyrene at a number of different pressures. At the pressures where Hugoniot data indicate phase transitions, P sub s zero and K' increase rapidly with pressure. In the same pressure range, the relaxation time decreases by nearly two orders of magnitude, indicating that molecular motion occurs more freely in the high-pressure phase. Greater freedom of molecular motion would enable the materials to be more easily polarized by both mechanical and electrical forces in agreement with the observed increase in both P sub s zero and K' at the phase transition. (Author)

AD-459 027 Field 11L, 13H
CFSTI Prices: HC$3.00

Puget Sound Naval Shipyard, Bremerton, Wash.
Quality Assurance Div.
CORE DELAMINATION AND SHEAR TESTS FOR LAMINATED WOOD.
Development rept.,
by R. F. England and W. H. Miles. Dec 64, 60p
Rept. no. PSNS-E-526-2
Proj. BUSHIPS SR007 03 02
Unclassified report

Descriptors: (*Wood, Laminates), (*Laminates, Wood), (*Non-destructive testing, Wood), Degradation, Shear stresses, Aging(Materials), Adhesives, Test methods.

A delamination and a shear test method using small cores drilled from wood laminates provide non-destructive and potentially low cost testing of glueline quality throughout the length and depth of laminated wood members. Cores 3/8 diameter obtained from the full depth of laminates by means of a special core drill are subjected to 16-24 hours of a 45 minute wetting and drying cycle in an automatic cycler to give a measure of delamination resistance. Similar cores for determination of shear strength and wood failure employ a tool adapted to a standard plywood tester. Comparative analyses include outdoor weathering, standard cross section 12-day test method and block shear together with proposed round robin standardization. (Author)

AD-461 181 Field 11F, 21E
CFSTI Prices: HC$2.00

Marine Engineering Lab., Annapolis, Md.
STATE-OF-THE-ART SURVEY ON HOT CORROSION IN MARINE GAS-TURBINE ENGINES,
by G. J. Danek. Mar 65, 41p
Rept. no. MEL-32/65
Projs. S R007 01 02, S F013 06 14, Tasks 0703, 3888
Unclassified report

Descriptors: (*Corrosion, Gas turbines), (*Gas turbines, Corrosion), Reviews, Bibliographies, Marine propulsion, Sulfides, Heat-resistant metals + alloys, Oxidation, Gas turbine blades, Nickel alloys, Cobalt alloys.

This summary describes a state-of-the-art survey of hot corrosion problems which can seriously limit the suitability of gas-turbine engines for marine propulsion systems. Catastrophic attack of nickel- and cobalt-base superalloys at temperature above 1550 F is attributed to the action of a molten slag that forms by the reaction of ingested sea salt and sulfur contained in the fuel. A general lack of agreement was found to exist among investigators on the mechanisms of sulfidation corrosion, methods of sorting and screening materials, resistance of specific materials to attack, and proposed solutions to the problem. Nevertheless, the collected information provided valuable guidance in formulating the Navy's Marine Gas-Turbine Alloy Development Program. A description of this program and specifications selected for standardized equipment to evaluate sulfidation resistance are presented. (Author)

BMI-X-329 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
CORROSION PROTECTION OF THE HYDROFLUORINATOR BY AN INERT GAS SPARGE,
by P. D. Miller, L. K. Matson, and E. F. Stephan.
5 Feb 65, 20p
Contract W-7405-eng-92

Unclassified report

Descriptors: (*Corrosion inhibition, Helium group gases).

BMI-X-10113 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
LONG-TERM CREEP RUPTURE OF SINTERED ALUMINUM POWDER AND ZIRCALOY-2 ALLOYS.
Summary rept.,
by John A. Vanecho and Stanley W. Porambka.
25 Jan 65, 28p
Contract W-7405-eng-92

Unclassified report

Descriptors: (*Powder alloys, Rupture), (*Creep, Rupture), Aluminum alloys, Zirconium alloys.

BNWL-79 Field 11F, 18J
CFSTI Prices: HC$4.00 MF$0.75

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
METALLURGY RESEARCH OPERATION.
Quarterly progress rept. for Jan-Mar 65.
15 Apr 65, 103p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Metallurgy, Reactor materials), (*Reactor materials, Metallurgy).

CONF-650210-1 Field 11F, 20B
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
PRECISE POLE FIGURE MEASUREMENTS ON ROLLED URANIUM SHEET,
by E. F. Sturcken. 18 Feb 65, 11p
Contract AT(07-2)-1 Unclassified report

Presented at the Application of X-ray Diffraction in the Atomic Energy Field Meeting, Richland, Wash.

Descriptors: (*Grain structures(Metallurgy), Uranium), (*X-ray diffraction analysis, Anisotropy).

CONF-650212-1 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
ELECTROMAGNETIC TESTING OF THIN WALL, REFRACTORY METAL TUBING.
by A. W. Bauer and J. P. Clark. 14 Oct 64, 18p
Contract AT(40-1)-2847

Unclassified report

Presented at the Society for Non-destructive Testing Spring Convention, Los Angeles, Calif. 22-26 Feb. 65.

Descriptors: (*Pipes, Refractory metals), (*Non-destructive testing, Pipes).

COO-987-4 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Wisconsin Univ., Madison.
DEFECT PHASES IN ALLOYS.
Final rept.
1964, 24p
Contract AT-11-1)-987

Unclassified report

Descriptors: (*Crystal lattice defects, Alloys), (*Alloys, Crystal lattice defects).

COO-1319-18 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Ohio State Univ. Research Foundation, Columbus.
A STUDY OF THE MECHANISM OF STRESS CORROSION CRACKING IN THE IRON - NICKEL - CHROMIUM ALLOY SYSTEM.
Quarterly rept. 17 Jun 64-16 Sep 64,
by F. H. Beck, M. G. Fontana, and J. P. Hirth.
6 Oct 64, 14p
Contract AT(11-1)-1319, Proj. RF-1673

Unclassified report

Descriptors: (*Corrosion, Stresses), Corrosive liquids, Iron alloys, Nickel alloys, Chromium alloys.

DRI-1092-201 Field 11B
CFSTI Prices: HC$1.00 MF$0.50

Denver Research Inst., Colo.
DETERMINATION OF PHASE EQUILIBRIA IN THE SYSTEM BEO - TH02.
Quarterly rept. no. 2,
by Henry E. Otto. 15 Mar 65, 8p
Contract AT(11-1)-1092

Unclassified report

Descriptors: (*Phase studies, Ceramic materials), (*Ceramic materials, Phase studies), Beryllium compounds, Thorium compounds, Oxides.

DRI-1092-202 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Denver Research Inst., Colo.

PHASE EQUILIBRIA OF THE TANTALUM-RICH REGION OF THE TANTALUM - TUNGSTEN - HAFNIUM AND TANTALUM - TUNGSTEN - ZIRCONIUM SYSTEMS.
Quarterly progress rept. no. 2,
by Donald T. Klodt and Albert S. Yamamoto.
Mar 65, 7p
Contract AT(11-1)-1092

Unclassified report

Descriptors: (*Phase studies, Refractory metal alloys), (*Refractory metal alloys, Transition elements).

DRI-1092-203 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Denver Research Inst., Colo.
STUDIES OF THE EFFECT OF INTERSTITIAL ADDITION ON THE PHASE EQUILIBRIA OF THE NIOBIUM-RICH REGION OF THE NIOBIUM - TUNGSTEN - HAFNIUM AND NIOBIUM - TUNGSTEN - ZIRCONIUM ALLOY SYSTEMS.
Quarterly progress rept. no. 2,
by Albert S. Yamamoto. Mar 65, 8p Unclassified report
Contract AT(11-1)-1092

Descriptors: (*Phase studies, Refractory metal alloys), (*Refractory metal alloys, Transition elements).

DRI-2197 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Denver Research Inst., Colo.
PHASE EQUILIBRIA OF THE TANTALUM-RICH REGION OF THE TANTALUM - TUNGSTEN - HAFNIUM AND TANTALUM - TUNGSTEN - ZIRCONIUM SYSTEMS.
Quarterly progress rept. no. 1,
by Donald T. Klodt and Albert S. Yamamoto.
Dec 64, 6p Unclassified report
Contract AT(11-1)-1092

Descriptors: (*Phase studies, Refractory metal alloys), (*Refractory metal alloys, Transition elements).

DRI-2198 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Denver Research Inst., Colo.
STUDIES OF THE EFFECT OF INTERSTITIAL ADDITION ON THE PHASE EQUILIBRIA OF THE NIOBIUM-RICH REGION OF THE NIOBIUM - TUNGSTEN - HAFNIUM AND NIOBIUM - TUNGSTEN - ZIRCONIUM ALLOY SYSTEMS,
by Albert S. Yamamoto. Dec 64, 5p
Contract AT(11-1)-1092

Unclassified report

Descriptors: (*Phase studies, Refractory metal alloys), (*Refractory metal alloys, Transition elements).

EURAEC-996 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
METALLOGRAPHY OF URANIUM NITRIDE,
by W. Musser, A. A. Bauer, and J. Bugl.
1965, 8p CONF-105-2, EUR-2228.E
Contract W-7405-eng-92

Unclassified report

Presented at the Atomic Energy Commission Metallography Group Meeting, (17th), Los Alamos, N. Mex. May 1963.

Descriptors: (*Metallography, Uranium compounds), (*Uranium compounds, Nitrides).

EURAEC-1075 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Geneva (Switzerland).
THE EFFECT OF SMALL ALLOY ADDITIONS ON THE PROPERTIES OF DISLOCATIONS IN ALPHA-IRON,
by D. G. Brandon, R. Anderson, and J. Spreadborough.
1964, 20p EUR-1751.E, CONF-640913-1
Contract 095-62-12 RDS

Unclassified report

Presented at the Faraday Society General Discussion on Dislocations in Solids, Gottingen, Germany 15-17 Sep 64.

Descriptors: (*Crystal lattice defects, Iron), (*Iron, Alloys).

EURAEC-1190 Field 11B
CFSTI Prices: HC$3.00 MF$0.75

Centre d'Etude de l'Energie Nucleaire, Mol (Belgium).
PHYSICAL PROPERTIES OF UO 2 SINGLE CRYSTALS.
Final rept. no. 2, 1 Mar 63-29 Feb 64.
1964, 65p Unclassified report
Contract 010.63-3-TEEB, Proj. 295

Descriptors: (*Single crystals, Uranium compounds), (*Uranium compounds, Oxides).

GEAP-4183 Field 11F
CFSTI Prices: HC$4.00 MF$0.75

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
SODIUM MASS TRANSFER. VI. STATISTICAL CORRELATIONS OF 1961 - 1962 CORROSION DATA,
by E. L. Dunn. Jul 63, 106p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Sodium, Transport properties), (*Statistical analysis, Transport properties).

GE-TM-63-7-3 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
PROPERTIES OF FE - CR - AL TYPE ALLOYS CONTAINING ADDITIONS OF YTTRIUM,
by C. S. Wukusick and J. F. Collins. 1963, 39p
Contract AT(40-1)-2847

Unclassified report

Presented at the ASTM Subcommittee on Resistance Heating Materials, Atlantic City, N. J. 25 Jun 63.

Descriptors: (*Iron alloys, Yttrium), (*Yttrium, Iron alloys).

N65-20886 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
SOLUBILITY AND DIFFUSION STUDIES OF ULTRA PURE TRANSITION ELEMENTS IN ULTRA PURE ALKALI METALS.
Quarterly rept. no. 6, 4 Oct 64-2 Jan 65,
by R. L. Mc Kisson and R. L. Eichelberger.
5 Mar 65, 27p AI-65-15
Contract NAS3-4163 Unclassified report
NASA CR-54096

Descriptors: (*Transition elements, Diffusion), (*Alkali metals, Transition elements).

N65-23692 Field 11B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EFFECTS OF SEVERAL METAL AND COMPOUND ADDITIONS ON GRAIN GROWTH OF OXIDES,
by Alan Arias. May 65, 16p
NASA-TN-D-2820
Unclassified report

Descriptors: (*Cermets, Microstructure), (*Oxides, Additives).

N65-23693 Field 11B, 13H
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EFFECT OF THREE METAL ADDITIONS ON GRAIN SIZE OF MAGNESIUM OXIDE AFTER HIGH-TEMPERATURE HEAT TREATMENTS.
Master's thesis,
by Alan Arias. May 1965, 16p NASA-TN-D-2823
Unclassified report

Descriptors: (*Cermets, Powder metallurgy), (*Magnesium compounds, Oxides), Grain structure-(Metallurgy), Ceramic materials.

N65-24116 Field 11C, 11F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
PRELIMINARY RESULTS OF A COMPARATIVE STUDY OF SEVERAL COMMERCIALLY AVAILABLE OXIDATION RESISTANT COATINGS ON Mo-0.5 Ti ALLOY SHEET,
by D. R. Rummler, B. A. Stein, and R. A. Pride.
1962, 16p NASA-TM-X-56184
Unclassified report

Presented at 6th meeting of the Refractory Composites Working Group, Dayton, Ohio, 16-19 Jun 1962.

Descriptors: (*Coatings, Refractory metal alloys), (*Molybdenum alloys, Titanium alloys).

N65-24117 Field 11F, 20K
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ANELASTIC BEHAVIOR OF COPPER SINGLE CRYSTALS AT LOW STRESES,
by C. A. Stearns, E. R. Gotsky, and J. P. Cusick.
26 Mar 64, 6p NASA-TM-X-51670
Unclassified report

Descriptors: (*Copper, Single crystals), (*Single crystals, Elasticity).

N65-24297 Field 11K
CFSTI Prices: HC$3.00 MF$0.75

Dynamic Science Corp., South Pasadena, Calif.
STERILIZATION HANDBOOK APPENDIX.
26 Aug 1964, 82p SN-37F
Contract NASw-777
NASA CR-62838
Unclassified report

Descriptors: (*Purification, Handbooks).

N65-26646 Field 11D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EXPERIMENTAL VERIFICATION OF AN ANALYTICAL DETERMINATION OF OVERALL THERMAL CONDUCTIVITY OF HONEYCOMB-CORE PANELS,
by C. W. Stroud. Jun 65, 13p NASA-TN-D-2866
Unclassified report

Descriptors: (*Sandwich panels, Thermal conductivity), (*Honeycomb cores, Thermal conductivity), Cobalt alloys.

N65-26653 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
HIGH-TEMPERATURE CREEP BEHAVIOR OF A COLUMBIUM ALLOY, FS-85,
by Robert H. Titran and Robert W. Hall.
Jun 65, 21p NASA-TN-D-2885
Unclassified report

Descriptors: (*Niobium alloys, Creep), (*Creep, Niobium alloys).

N65-26655 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Adminstration, Cleveland, Ohio. Lewis Research Center.
THE EFFECT OF VACUUM ON THE FATIGUE AND STRESS-RUPTURE PROPERTIES OF S-816 AND INCONEL 550 AT 1500F,
by Alfred Nachtigall, Stanley J. Klima, John C. Freche, and Charles A. Hoffman. Jun 65, 27p
NASA-TN-D-2898
Unclassified report

Descriptors: (*Cobalt alloys, Fatigue(Mechanics)), (*Nickel alloys, Rupture), Vacuum.

N65-28635 Field 11F
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
FATIGUE OF FOUR STAINLESS STEELS AND THREE TITANIUM ALLOYS BEFORE AND AFTER EXPOSURE TO 550F (561K) UP TO 8800 HOURS,
by Walter Illg and Claude B. Castle. Jul 65, 57p
NASA-TN-D-2899
Unclassified report

Descriptors: (*Stainless steel, Fatigue(Mechanics)), (*Titanium alloys, Fatigue(Mechanics)), Thermal stresses.

NMI-6021.13 Field 11F
CFSTI Prices: HC$3.00 MF$0.75

Nuclear Metals, Inc., West Concord, Mass.
FINE GRAIN SIZE IN BERYLLIUM BY SPLATCOOLING.
Final rept.,
by A. R. Kaufmann and W. C. Muller. 15 Nov 63, 60p
Contract AT(30-1)-1565
Unclassified report

Descriptors: (*Beryllium, Phase studies), (*Grain structures(Metallurgy), Beryllium).

NMI-7004 Field 11F, 18J, 20B
CFSTI Prices: HC$1.00 MF$0.50

Nuclear Metals, Inc., Concord, Mass.
STRUCTURES RESULTING FROM EXTRUSION OF URANIUM AT TEMPERATURES HIGH IN THE ALPHA PHASE,
by A. D. Donaldson. 19 Oct 60, 20p
Contract AT(30-1)-1565

Unclassified report

Descriptors: (*Uranium, Extrusion), (*Extrusion, Uranium), Transition temperature, Crystallography, Grain structure(Metallurgy).

NYO-2471-4 Field 11F
CFSTI Prices: HC$5.00 MF$1.00

Cornell Univ., Ithaca, N. Y. Materials Science Center.
A LOW TEMPERATURE INTERNAL FRICTION STUDY OF ALUMINUM AND MAGNESIUM AT 1 CPS.
Doctoral thesis,
by Jules Lazar Routbort, II. Feb 65, 154p
Rept. no. 281

Unclassified report

Descriptors: (*Internal friction, Low-temperature research), (*Aluminum, Internal friction), (*Magnesium, Internal friction).

ORNL-3751 Field 11F
CFSTI Prices: HC$4.00 MF$0.75

Oak Ridge National Lab., Tenn.
THE EFFECT OF OXYGEN ON THE CORROSION OF NIOBIUM BY LIQUID POTASSIUM.
Master's thesis,
by Arnold Powell Litman. Jul 65, 113p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Corrosion, Niobium), (*Niobium, Corrosion), Corrosive liquids, Potassium, Oxygen).

Patent 3,198,660 Field 11E

TREATMENT OF CELLULOSIC TEXTILE FABRICS WITH BISFORMAMIDE-FORMALDEHYDE ADDUCTS.
Patent assigned to Agriculture.
by Sidney L. Vail, John G. Frick, Jr., and Wilson A. Reeves. 3 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Textiles, Cellulose), (*Impregnation, Textiles), Patents, Protective treatments, Formaldehyde, Formamides, Catalysts, Finishes + finishing, Magnesium compounds, Chlorides, Zinc compounds, Borates.

The textile treating agents render cellulosic textile fabrics wrinkle resistant. The fabrics have improved resilience and possess wash-and-wear properties. The fabrics are impregnated with an aqueous material containing 5 to 20 percent, by weight, of the reaction product of 2 moles of formaldehyde and 1 mole of methylenebisformamide, and 5 percent of magnesium chloride. The fabric is heated to dry and cure the material.

Patent 3,200,006 Field 11A, 11I, 11C

METHOD FOR COATING HIGH POLYMERS WITH POLYTETRAFLUOROETHYLENE.
Patent assigned to Navy,
by Vincent G. FitzSimmons. 10 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Halocarbon plastics, Adhesion), (*Polymers, Adhesion), (*Coatings, Halocarbon plastics), Organic solvents, Acrylic resins, Organic compounds, Patents.

O-Rings may be coated to eliminate adhesion to surfaces when used as gas seals. Thin films of polytetrafluoroethylene can be firmly adhered to solid organic high polymer surfaces, without involving sintering of the polytetrafluoroethylene by spray-coating the surface of the high polymer with a small amount of a volatile organic solvent for the high polymer which is sufficient to cause the surface to become tacky and with a watermoist, non-specular thin film of polytetrafluoroethylene of a thickness not over 0.2 mil from the one spray containing both the volatile solvent and an aqueous dispersion of polytetrafluoroethylene, and allowing the coated high polymer to dry in the air for a time sufficient to evaporate a substantial proportion of the water and volatile solvent therefrom.

Patent 3,201,082 Field 11A

CORROSION RESISTANT SEALING STRUCTURE.
Patent assigned to AEC,
by Raphael Rosen. 17 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Seals(Stoppers), Corrosion inhibition), (*Valves, Corrosion inhibition), Fluorine, Fluids, Synthetic rubber, Elastomers, Aliphatic compounds, Plastic seals, Corrosive liquids, Vapor pressure, Carbon, Oxygen, Chlorine, Halocarbon plastics, Patents.

The valve is resistant to loss of sealing effectiveness under the action of corrosive fluids, particularly fluorine-containing fluids. The valve includes a pressure member and a cooperating resilient valve closure member. The closure member comprises an elastomer having a completely fluorinated aliphatic compound with low vapor pressure incorporated in it. The fluorinated compound is composed of carbon, fluorine, chlorine and oxygen.

Patent 3,201,348 Field 11H

MINERAL LUBRICATING OILS CONTAINING PHOSPHITE-MOLYBDENUM PENTACHLORIDE REACTION PRODUCTS.
Patent assigned to Standard Oil Co., Chicago, Ill.,
by Edwin L. De Young. 17 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Antioxidants), (*Antioxidants, Lubricant additives), (*Phosphites, Lubricant additives), (*Molybdenum, Lubricant additives), Patents, Chlorides, Metalorganic compounds, Mineral oils, Organic sulfur compounds, Organic phosphorus compounds, Polyethylene plastics, Barium compounds, Phosphorus compounds, Sulfides, Corrosion inhibition.

Oil-soluble reaction products of molybdenum pentachloride and hydrocarbyl substituted phosphites are

added to mineral lubricating oils to provide anti-oxidative and metal corrosion inhibiting properties. From 0.2 to 0.5 percent of the reaction products are incorporated in mineral lubricating oils to impart corrosion inhibiting properties. The composition will also inhibit the corrosion of silver and similar metals found in automotive and diesel engines, by sulfur and/or organic sulfur-containing compounds.

Patent 3,201,349 Field 11H

EMULSIFIABLE OIL COMPOSITION.
Patent assigned to Sinclair Research, Inc., New York,
by Richard L. Quanstrom. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Antioxidants), (*Antioxidants, Lubricant additives), (*Cutting fluids, Lubricant additives), (*Amines, Antioxidants), Colloids, Mineral oils, Sulfonates, Glycols, Sodium compounds, Nitrates, Potassium compounds, Corrosion inhibition, Patents.

An alcohol amine, an oil-soluble tetiary amine and sodium nitrite are combined with a mineral lubricating oil base to form a rust and corrosion inhibiting lubricant for use with cast iron and low carbon steels. A cutting and grinding fluid containing a mineral oil base, from 1 to 5 percent water, 0.5 to 3 percent tri-n-butyl amine, 0.1 to 1 percent 2-amino-2-ethyl-1,3-propanediol and from 0.5 to 3 percent sodium nitrite effectively inhibits corrosion and rust. This cutting and grinding fluid is non-volatile and has excellent cooling and lubricating properties.

Patent 3,201,350 Field 11H

LUBRICANTS CONTAINING A SCHIFF BASE.
Patent assigned to Monsanto Research Corporation,
St. Louis, Mo.,
by Kenneth L. McHugh and John O. Smith. 17 Aug 65,
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Antioxidants), (*Antioxidants, Lubricant additives), (*Amines, Lubricant additives), Esters, Polymers, Fatty acid esters, Aldehydes, Aromatic compounds, Corrosion inhibition, Polyester plastics, Patents.

A corrosion and oxidation inhibitor for polyester lubricants employed in jet and rocket engines, diesels, and in transformer oils is a N,N'-dibenzylidenephenylenediamine compound having methylenedioxy radicals. Lubricant bases may be di- or polyesters of polyhydric alcohols or poly- or monocarboxylic acids, having from 0.01 to 10 weight percent of the additive blended into them. One lubricating oil consists of trimethylolpropane caproate containing up to 10 percent of N,N'-bis(3-methoxy-4-hydroxybenzylidene)-p-phenylenediamine. The lubricants are suitable for high temperature uses, and as cable, electric switch, and hydraulic oils.

Patent 3,201,351 Field 11H

MINERAL OIL COMPOSITIONS.
Patent assigned to Monsanto Co., Dayton, Ohio,
by Joseph E. Fields and John H. Johnson.
17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Mineral oils, Lubricant additives), Cleaning compounds, Barium compounds, Polymers, Hydrolysis, Stability, Patents.

An isobutylene/dialkyl fumarate copolymer incorporated in mineral oils as a viscosity index improver and pour point depressant has improved hydrolysis stability in the presence of barium and other basic detergent additives. Low-temperature detergency is enhanced if a minor amount of vinyl acetate, styrene, vinyloxyethanol, or an alkyl methacrylate, is added to the fumarate compound. Isobutylene is reacted with equimolar amounts of an alkyl fumarate having from 6 to 24 carbon atoms in the alkyl radical. A lubricating oil for internal combustion engines is charged with from 0.1 to 10 percent by weight of the additive.

Patent 3,201,863 Field 11D, 11F

METHOD OF MAKING MOLYBDENUM AND HIGH TEMPERATURE OXIDATION RESISTANT ALLOY LAMINATED COMPOSITE MATERIAL.
Patent assigned to Air Force,
by Edwin D. Sayre. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Heat-resistant metals + alloys, Laminates), (*Composite materials, Heat-resistant metals + alloys), Molybdenum alloys, Nickel alloys, Chromium alloys, Oxidation, Diffusion, Welding, Sheets, Patents.

The laminated material may be used to fabricate turbine buckets, nozzle diaphragm partitions and other high temperature parts. The material is made by interleaving thin sheets of molybdenum with thin sheets of a nickel chromium alloy. The stack is heated and pressure is applied to cause diffusion welding of the metal sheets.

Patent 3,202,506 Field 11F

HIGH-TEMPERATURE OXIDATION-RESISTANT COBALT BASE ALLOYS.
Patent assigned to AEC,
by David E. Deutsch. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Cobalt alloys, Heat-resistant metals + alloys), Chromium alloys, Tungsten alloys, Tantalum alloys, Niobium alloys, Molybdenum alloys, Yttrium, Carbon alloys, Oxidation, Antioxidants.

The cobalt alloys are used in the fabrication of jet engine turbine blades, supercharger parts, and the like. The alloy contains, by weight, 12 to 24 percent of chromium, 6 to 12 percent of tungsten, up to 12 percent of tantalum, niobium and molybdenum, 0.30 to 1.25 percent of carbon, 0.05 to 2.5 percent of yttrium and the remainder cobalt.

Patent 3,202,606 Field 11H

LUBRICANT CONTAINING CALCIUM SALTS OF ACETIC ACID, C14 to C30 FATTY ACID, AND PHOSPHOSULFURIZED POLYOLEFIN.
Patent assigned to Esso Research and Engineering Co.,
Linden, N. J.,
by Arnold J. Morway and Albert J. Bodner. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricants, Preparation), (*Acetates, Lubricants), (*Fatty acids, Lubricants), (*Polyethylene plastics, Lubricants), Calcium compounds, Salts, Organic sulfur compounds, Organic phosphorus compounds, Wear resistance, Diesel engines, Marine engines, Patents.

A lubricant for marine diesel centralized forced-feed lubrication systems exhibits improved storage stability and anti-wear properties when a fatty acid of 14 to 30 carbon atoms and a phosphorosulfurized polybutene are incorporated in the thickening agent. The thickener is composed of calcium acetate having a particulate size of about 2 microns, the calcium salts of tallow, oleic, erucic, or myristoleic acid, or a mixture of these fatty acids, and phosphorus pentasulfide-treated polyisobutylene. A mineral oil or a polycarbonate, ester, or silicone oil base contains from 3 to 8 weight percent acetate and tallow acid salt in mole ratios ranging from 5:1 to 50:1, and from 2 to 5 percent phosphorosulfurized polyolefin. Lubricating compositions containing the additive show a reduced tendency to gel under hot conditions.

Patent 3,202,607 Field 11H

METAL WORKING FLUIDS.
Patent assigned to Celanese Corp. of America, New York, by John E. Koch, Jr. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Cutting fluids, Preparation), (*Glycols, Cutting oils), Polymers, Vegetable oils, Ethylene oxide, Complex compounds, Organic sulfur compounds, Amines, Patents.

A water base fluid for cutting, broaching, grinding, rolling, and threading of copper, brass, stainless steel, and other hard alloys is composed of glycol and one or more polyoxyethylene adducts of castor oil, and up to 15 weight percent of extreme pressure, anti-rust, and bacteriostatic agents. The non-aqueous component includes from 10 to 45 weight percent of the polyoxyethylene adducts of castor oil, from 5 to 30 weight percent of hexylene glycol, and from 35 to 65 percent of a mixture of propylene and dipropylene glycol. The composition is dispersed in water such that the ratio of water to non-aqueous mixture ranges from 5:1 to 40:1. The fluid reduces grinding wheel wear and has improved heat dissipating qualities. It is suitable for working steels and alloys of extreme toughness and hardness such as the alloys of nickel, titanium, chromium, or molybdenum.

Patent 3,202,608 Field 11H

LUBRICATING COMPOSITIONS AND POLYMERIC ADDITIVES THEREFOR.
Patent assigned to Shell Oil Co., New York, by Adriaan H. Wagenaar. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Polymers), (*Polymers, Lubricant additives), Acrylic resins, Aldehydes, Copolymerization, Amines, Phosphites, Wear resistance, Cleaning compounds, Patents.

A polymeric additive having detergency, anti-wear, and anti-sludge properties for lubricants used in aviation and automotive engines is an amine- and phosphite- treated reaction product of acrolein or methacrolein and an alkyl methacrylate. Stearyl methacrylate, or a methacrylate having from 12 to 18 carbon atoms in the alkyl radical, is combined with aldehydes in molar ratios varying from 0.8:1 to 1.3:1, and treated with an alkylamine or alkanolamine and diethyl or dimethyl phosphite. From 0.1 to 10 percent of the additive is dispersed in a mineral lubricating oil, with from 0.01 to 2 percent of a phenolic anti-oxidant and a minor amount of a phosphate anti-scuffing agent. The lubricating compositions are suitable for high temperature and high speed applications.

Patent 3,202,610 Field 11H

LUBRICANTS CONTAINING POLYMERIC EXTREME PRESSURE AGENTS.
Patent assigned to Shell Oil Co., New York, by Herbert C. Evans and Peter Kirby. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Polymers), (*Polymers, Lubricant additives), Halogenated hydrocarbons, Chlorine compounds, Polymerization, Catalysts, Metalorganic compounds, Aluminum compounds, Titanium compounds, Chlorides, Organic solvents, Pressure, Patents.

An alkyl or aryl substituted allyl halide having from 1 to 6 carbon atoms in the alkyl radical is polymerized in hexane or isooctane using a Zeigler catalyst to form an additive possessing extreme pressure and anti-wear properties for gear and crankcase oils. The catalyst includes the chlorides, bromides, iodides, or oxychlorides of titanium, lead, or tin, and aluminum trialkyl, or zinc or magnesium dialkyls. Methallyl chloride is polymerized at temperatures from 10 to 50 degrees C. in the presence of titanium tetrachloride and aluminum triethyl and isooctane. The compound is employed in mineral and synthetic ester type oils in amounts from 2 to 5 percent by weight. 8 claims.

Patent 3,203,895 Field 11H

LUBRICATING OILS CONTAINING AMINE SALTS OF PHOSPATES.
Patent assigned to Universal Oil Products Co., Des Plaines, Ill., by Edwin J. Iatos and Anthony J. Guarnaccio. 31 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Phosphates), (*Phosphates, Lubricant additives), Amines, Phenols, Glycols, Polymers, Salts, Greases, Corrosion inhibition, Stabilization, Patents.

An anti-corrosive and lubricity additive for industrial and automotive lubricants and cutting, rolling, and slushing oils is a mixture of a salt of N-tallow-1,3-diaminopropane and a polyoxyethylenated alkylphenol phosphate and a salt of N-tallow-1,3-diaminopropane and mixed mono- and di-isooctyl acid orthophosphate. Portions of each component vary from 5 to 95 percent. The alkylphenol phosphate contains from 6 to 15 carbon atoms in the alkyl radical. A mineral oil base has a viscosity ranging from 10 SUS at 100 degrees F. to 1000 SUS at 210 degrees F., and contains from 0.01 to 25 percent by weight of the additive. Petroleum sulfonic acids or other emulsifiers may be employed, and emulsified oils for metal working purposes may contain from 0.25 to 98 percent water. 4 claims.

Patent 3,203,896 Field 11H

LUBRICATING COMPOSITION.
Patent assigned to Universal Oil Products Co., Des Plaines, Ill., by Edwin J. Latos and Anthony J. Guarnaccio. 31 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Amines), Salts, Aliphatic compounds, Carboxylic acids, Antioxidants, Phenols, Greases, Stabilization, Phosphates, Patents.

A thickener for transformer, gear, cylinder, and turbine oils is composed of the neutral salts of N-tallow-1, 3-diaminopropane and dicarboxylic acid, N-tallow-1,3-diaminopropane and a mixed mono- and dialkyl acid orthophosphate, and a phenolic antioxidant. The carboxylic acid may be sebacic, dilinoleic, adipic, or azelaic acid, or that component may be a mixture of a monocarboxylic and a polycarboxylic acid. The orthophosphate contains from 5 to 20 carbon atoms in the alkyl radical, and one composition is a mixture of mono- and di-isooctyl acid orthophosphates. The additive contains from 1 to 40 weight percent of 2,6-ditertiarybutyl-4-methylphenol as an anti-oxidant. Diaminopropane and carboxylic acid are combined in stoichoimetric amounts, but there is one equivalent of phosphate per two equivalents of diaminopropane. Multi-purpose industrial lubricants utilize from 0.01 to 20 percent by weight of the thickener, which is a blend of from 5 to 95 percent of diaminopropane/carboxylic acid salt in diaminopropane/phosphate.

Patent 3,203,897 Field 11H

SODIUM SOAP GREASE CONTAINING A ZINC SALT OF A DIALKYL DITHIOPHOSPHATE.
Patent assigned to Gulf Research and Development Co., Pittsburgh, Pa., by Henry A. Ambrose and Paul R. McCarthy. 31 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Greases, Lubricant additives), (*Lubricant additives, Phosphates), (*Zinc compounds, Lubricant additives), (*Phosphates, Lubricant additives), Sodium compounds, Soaps, Sulfur compounds, Heat-resistant materials, Fatty acids, Amines, Patents.

A high temperature grease for roller and ball bearings operating at temperatures above 200 degrees F utilizes the metal soap of an aliphatic normal fatty acid having from 12 to 32 carbon atoms and the zinc salt of a dithiophosphoric acid ester as the thickening agent. Barium, lithium, strontium, or sodium compounds are reacted with hydrogenated fish oil fatty acids, and then combined with the zinc, calcium, or barium salts of dialkyl dithiophosphoric acid. The dithiophosphoric acid is prepared by reacting a technical mixture of alcohols having from 6 to 8 carbon atoms each with phosphorus pentasulfide. A grease composition contains from 15 to 35 weight percent of the sodium soap and from 5 to 15 percent of zinc salt. The glycerin obtained in saponifying a fat is retained in amounts ranging from 1 to 3 percent. From 0.1 to 1.5 percent of diphenylamine is employed as an oxidation inhibitor.

Patent 3,205,171 Field 11H

THICKENING OF HIGH TEMPERATURE CREASES.
Patent assigned to Standard Oil Co., Chicago, Ill., by John C. Goossens. 7 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Greases, Lubricant additives), High-temperature research, Catalysts, Acids, Lubricants, Silicone plastics, Amines, Organic sulfur compounds, Patents.

Melamine is reacted with dimethyl sulfoxides to form a thickening agent for high temperature greases. Greases used at temperatures as high as 450 degrees F. such as in jet propulsion and atomic energy engines are thickened with the thermally stable reaction product of melamine and dimethyl sulfoxide. Mineral and synthetic lubricating oils are thickened with from 5 to 75 weight percent of the product obtained by reacting melamine with dimethyl sulfoxide in the presence of at least one percent of an acid catalyst.

Patent 3,205,172 Field 11H, 7C

UNIVERSAL MACHINING FLUID.
Patent assigned to Eastman Kodak Co., Rochester, N. Y., by Charles H. Benton. 7 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Cutting fluids, Colloids), Coolants, Wear resistance, Lubricant additives, Additives, Carboxylic acids, Fatty acids, Germicides, Chemotherapeutic agents, Antioxidants, Lubricants, Patents.

A diacetyl triglyceride composition having high heat removing and anti-wear characteristics functions solely as a machine tool cutting fluid, or as an additive for oil-in-water emulsions. The glyceride compound is composed of two acetic acid moieties and a higher fatty acid moiety which is an acyl radical having from 14 to 22 carbon atoms. From 0.1 to 1 percent by weight of hexyl resorcinol, hexachlorophene, or sodium trichlorophenate or similar bactericides enhance the bacteriostatic properties of the additive. An emulsified product contains from 94 to 99 weight percent water, from 1 to 5 percent triglyceride, and from 15 to 20 percent by weight of triglyceride of an alkylaryl sulfonate or sulfated fatty alcohol emulsifier. A minor amount of a sodium nitrite/sodium nitrate rust inhibitor may be incorporated in the machining fluid.

Patent 3,205,173 Field 11H, 7C

SYNTHETIC LUBRICATING OILS COMPRISING DEHYDROCONDENSATION PRODUCTS OF MONO-ESTERS.
Patent assigned to Socony Mobil Oil Co., Inc., by Herbert L. Hepplewhite, Edward A. Oberright, and Albert L. Williams. 7 Sep 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricants, Esters), (*Esters, Lubricants), Aliphatic compounds, Carboxylic acids, Alcohols, Peroxides, Condensation reactions, Viscosity, Greases, Patents.

Mono-esters derived from aliphatic monocarboxylic acids and aliphatic monohydroxy alcohols each having up to 18 carbon atoms are treated with tertiary alkyl

peroxides to form a lubricating oil for aviation and automotive engines. Suitable peroxides are di-t-amyl, di-t-butyl, or di-t-octyl peroxides. Ester compounds are exemplified by octyl or decyl acetate, butyl stearate, methyl oleate, or methyl myristate. The compounds are reacted by mixing, in amounts ranging from one-sixth to two mols of peroxide per mol of mono-ester, and heating the mixture to temperatures from 100 to 200 degrees C. The viscosity increases with increased amounts of peroxide, and the kinematic viscosity ranges from 3 to 500 cs. at 210 degrees F. At higher viscosities the dehydrocondensation products are useful asviscosity index improvers and thickeners for oils and greases.

PB-168 175 Field 11I, 19A, 21I
CFSTI Prices: HC$7.00 MF$2.00

Feltman Research and Engineering Labs., Picatinny Arsenal, Dover, N. J.
COMPATIBILITY OF EXPLOSIVES WITH POLYMERS,
by Marjorie C. St. Cyr. Mar 59, 368p
Technical rept. no. TR-2595
AD 207 076
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Propellants, Compatibility), (*Polymers, Compatibility), (*Explosive materials, Compatibility), (*Compatibility, Handbooks), Reviews, Containers, Mechanical properties, Vacuum, Stability, Pyrolysis, Acrylic resins, Cellulosic plastics, Epoxy plastics, Polyethylene plastics, Halocarbon plastics, Polyamide plastics, Phenolic plastics, Polyester plastics, Silicone Plastics, Styrene plastics, Synthetic rubber, Vinyl plastics.

The goal of the work is to provide an authoritative and up-to-date handbook which will be useful to design engineers and chemists in selecting polymeric materials for applications involving prolonged contact with explosives and propellants. A section is included for each of the following classes of polymers: acrylates, cellulosics, epoxies, ethylenes and fluorocarbons, furanes, polyamides (nylons), phenolics, polyesters, silicones, styrene polymers and copolymers, synthetic rubbers and rubber derivatives, vinyl polymers and copolymers, and miscellaneous resins. Each section contains a brief description and evaluation, followed by relevant tables and figures. For propellants and explosives, results of vacuum-stability tests and 100C heat tests are given. The effects of contact on the polymers are reported chiefly in terms of the results of physical and mechanical properties tests. (Author)

PB-168 350 Field 11F
CFSTI Prices: HC$6.00 MF$1.25

National Bureau of Standards, Washington, D. C.
UNDERGROUND CORROSION,
by Melvin Romanoff. 1 Apr 57, 232p
Circular no. 579
Unclassified report

Descriptors: (*Corrosion, Underground structures), (*Underground structures, Corrosion inhibition), Soils, Coatings, Protective treatments, Electrolysis, Environmental tests, Cathodic protection, Bituminous coatings, Iron, Steel, Pipes, Lead, Zinc, Aluminum, Copper, Copper alloys, Stainless steel, Concrete, Composite materials, Asbestos.

The Circular is a final report on the studies of underground corrosion conducted by the National Bureau of Standards from 1910 to 1955. Up to 1922, the studies were confined to corrosion due to stray-current electrolysis and its mitigation. After it became apparent that serious corrosion occurred in soils under conditions that precluded stray-currents as an explanation, a field burial program was initiated in order to obtain information pertaining to the effect of soil properties on the corrosion of metals. More than 36,500 specimens, representing 333 varieties of ferrous, nonferrous, and protective coating materials, were exposed in 128 test locations throughout the United States. During this time the electrical and electrochemical aspects of underground corrosion have been continuously studied in the laboratory. Results from both field and laboratory investigations are presented. (Author)

PB-168 478 Field 11D, 11I
CFSTI Prices: HC$2.00 MF$0.50

Forest Products Lab., Madison, Wis.
EFFECTS OF VARIOUS METHODS OF WET CONDITIONING ON THE STRENGTH PROPERTIES OF SEVERAL GLASS-FABRIC-REINFORCED PLASTIC LAMINATES,
Rept. for Aug 56-Apr 58,
by Bert P. Munthe and Robert L. Youngs. Mar 59, 33p
Contract AF33 616 58 1, Proj. 7340, Task 73400
WADC TR-58-486, AD 210 225
Unclassified report

Descriptors: (*Laminated plastics, Environmental tests), (*Glass textiles, Reinforcing materials), Epoxy plastics, Polyester plastics, Phenolic plastics, Silicon plastics, Tensile properties, Compressive properties, Deformation, Liquid immersion tests, Boiling, Humidity, Aging(Materials), Degradation.

The report presents the results of tests to evaluate the effects of various types and durations of wet exposure on the tensile, compressive, and flexural properties of epoxy, polyester, phenolic, and silicone laminates reinforced with 181 glass fabric that had various types of fabric finish. The tests were made after normal conditioning and after various periods of wet exposure. Wet conditions used were (1) immersion in water at 73 F., (2) exposure to an atmosphere at 100 F. and approximately 100 percent humidity, or (3) boiling in water. Tensile strengths were reduced about equally by 30 days in water at 73 F. or by 2 hours in boiling water. Compressive strengths were reduced about the same amount by either 2 hours in boiling water, 30 days in water at room temperature, or 30 days at high humidity. Modulus of rupture was reduced about equally by equal periods of immersion in water at room temperature or exposure to high humidity at 100 F. At either of these conditions, the reduction after 30 days was generally similar to that observed after exposure in boiling water for 1/2 or 1 hour, but was generally less than that observed after exposure for 2 hours in boiling water. The various laminates differed considerably in their response to the various wet exposure conditions. However, the results indicate that a 2-hour wet exposure in boiling water is a reasonable substitute for the standard 30-day immersion in water at room temperature. (Author)

SB-415 Suppl. 1 Field 11F

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
MOLYBDENUM AND TUNGSTEN.
Price list, selective bibliography of government research repts. and translations for Jul 60-Jun 65.
Jun 65, 48p
Unclassified report

Available free from the Clearinghouse.

Descriptors: (*Molybdenum, Bibliographies), (*Tungsten, Bibliographies), (*Bibliographies, Heat-resistant metals + alloys), Molybdenum alloys, Tungsten alloys, Carbides, Patents, Refractory metals, Refractory metal alloys.

Lists 877 domestic and foreign references on molybdenum and tungsten added to the CFSTI collection during the period July 1960 through June 1965. Reports are listed in the following categories: Molybdenum and Tungsten Metals and Alloys; Molybdenum and Tungsten Carbides and Compounds; Patents on Molybdenum and Tungsten available for license.

SCNC-318 Field 11C
CFSTI Prices: HC$2.00 MF$0.75

Sylvania-Corning Nuclear Corp., Bayside, N. Y.
IMPROVED OXIDATION-RESISTANT COATINGS FOR NIOBIUM ALLOYS,
by L. Sama, B. Brodwin, and J. Grubessich.
Feb 61, 45p
Contract AT(30-1)-GEN-366
Unclassified report

Descriptors: (*Antioxidants, Niobium alloys), (*Coatings, Antioxidants).

TID-3583 Field 11F
CFSTI Prices: HC$3.00 MF$0.50

Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
BISMUTH, LEAD, AND TIN TELLURIDES. A LITERATURE SEARCH,
comp. by Sidney F. Lanier. May 65, 56p
Unclassified report

Descriptors: (*Tellurium alloys, Intermetallic compounds), Bismuth alloys, Lead alloys, Tin alloys.

TID-21478 Field 11B
CFSTI Prices: HC$1.00 MF$0.50

Denver Research Inst., Colo.
DETERMINATION OF PHASE EQUILIBRIA IN THE SYSTEM BED - THO 2.
Quarterly rept. no. 1,
by Henry E. Otto. 15 Dec 64, 5p
Contract AT(11-1)-1092
Unclassified report

Descriptors: (*Phase studies, Ceramic materials), (*Ceramic materials, Phase studies), Beryllium compounds, Thorium compounds, Oxides.

TID-21623 Field 11B
CFSTI Prices: HC$2.00 MF$0.50

Utah Univ., Salt Lake City. Inst. of Metals and Explosives Research.
INITIAL GRAIN GROWTH STUDIES OF THORIA GEL.
Technical rept. no. 25,
by Brong D. Chun and Milton E. Wadsworth. 1 Dec 64, 47p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Grain structures(Metallurgy), Thorium compounds), (*Thorium compounds, Crystal growth), Oxides, Gels.

UCRL-12307 Field 11K, 7C
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
PREPARATION AND PROPERTIES OF FLUOROCARBON ALCOHOL 3,5-DINITROBENZOATES FOR STUDY AS SURFACE ACTIVE AGENTS,
by Eugene R. Bissell. 21 Dec 64, 10p N65-19659
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Surface-active substances, Benzoates), (*Benzoates, Surface-active substances).

12. Mathematical Sciences

N65-20114 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
NUMERICAL INTEGRATION BY GAUSSIAN QUADRATURE.
Technical preprint,
by Charles M. Goldstein. 1965, 16p
NASA-TM-X-52008
Unclassified report

Prepared for the Semiannual SHARE Meeting (24th), Los Angeles, Calif., 1 Mar 65.

Descriptors: (*Integration, Numerical methods + procedures).

N65-23327 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

University of Southern Calif., Los Angeles Electronic Sciences Lab.
GENERALIZED BARKER SEQUENCES,
by Solomon W. Golomb and Robert A. Scholtz.
Feb 1965, 17p USCEE-123
Contracts NAS7-100, JPL-951076
NASA CR-62634
Unclassified report

Descriptors: (*Sequences, Complex numbers), (*Statistical functions, Sequences).

N65-23661 Field 12A, 9B
CFSTI Prices: HC$1.00 MF$0.50

Wisconsin Univ., Madison. Theoretical Chemistry Inst.
A NEW ALGORITHM FOR QUADRATURE,
by Gunter G. Weber. 26 Mar 65, 20p WIS-TC1-79
Grant NsG-275-62
NASA CR-62662
Unclassified report

Descriptors: (*Quadratic programming, Functions).

13. Mechanical, Industrial, Civil, and Marine Engineering

AD-406 631 Field 13H, 9A
CFSTI Prices: HC$2.00

General Electric Co., Syracuse, N. Y. Heavy Military Electronics Dept.
SOLDERABILITY OF TERMINALS AND AGING.
Quarterly progress rept. no. 2, 1 Jan-31 Mar 63,

by J. A. De Vore. 31 Mar 63, 35p
Contract DA36 039AMC00008E, Task 702
Unclassified report

Descriptors: (*Aging(Materials), Test methods), (*Soldering, Test methods), Heat, Steam, Boiling, Copper, Brass, Nickel, Soldering fluxes, Tables, Tests, Experimental data, Nickel alloys, Iron alloys, Electric terminals, Electronic equipment.

The objective of this project is to develop test methods for the solderability of lugs, tabs, stranded wire, etc., and to develop a simulated short time aging test to duplicate 6 or 12 months natural aging of wires, lugs, etc. which are to be soldered. This quarterly report discusses the investigation of three artificial aging methods. These are boiling distilled water, heat, and steam. Also discussed are the data collected on the development of a solderability test. The method investigated was flowing of a preform using three different heat sources. (Author)

CONF-729-2 Field 13H, 11F
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
SOLID-STATE BONDING OF BERYLLIUM,
by Edwin S. Hodge, Paul J. Gripshover, and Hugh D. Hanes. 1963, 10p
Contract W-7405-eng-92
Unclassified report

Descriptors: (*Bonding, Beryllium), (*Beryllium, Solid state physics).

KAPL-M-6446 Field 13D, 13L
CFSTI Prices: HC$2.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
THE DESIGN OF BARRICADES FOR HAZARDOUS PRESSURE SYSTEMS,
by C. V. Moore. 5 Feb 65, 46p CVM-24
Contract W-31-109-eng-52
Unclassified report

Descriptors: (*Pressure vessels, Safety).

N65-21775 Field 13M
CFSTI Prices: HC$6.00 MF$1.25

Douglas Aircraft Co., Inc., Santa Monica, Calif.
Missile and Space Systems Div.
FABRICATION AND EXPERIMENTAL EVALUATION OF COMMON DOMES HAVING WAFFLE-LIKE STIFFENING. PART 1: PROGRAM DEVELOPMENT,
by R. R. Meyer and R. J. Bellifante. Nov 1964, 203p SM-47742
Contract NAS8-11542
NASA CR-62257
Unclassified report

Descriptors: (*Structures, Reinforcing materials).

N65-21776 Field 13M
CFSTI Prices: HC$3.00 MF$0.75

Douglas Aircraft Co., Inc., Santa Monica, Calif.
Missile and Space Systems Div.
FABRICATION AND EXPERIMENTAL EVALUATION OF COMMON DOMES HAVING WAFFLE-LIKE STIFFENING. PART II. DESIGN TABLES FOR GEODESIC GRID STIFFENED SPHERICAL DOMES UNDER EXTERNAL PRESSURE,
by R. R. Meyer and R. J. Bellifante.
Nov 64, 84p SM-47742
Contract NAS8-11542
NASA CR-62269
Unclassified report

Descriptors: (*Structures, Reinforcing materials), (*Spheres, Design).

N65-24305 Field 13H, 11D
CFSTI Prices: HC$1.00 MF$0.50

Douglas Aircraft Co., Inc., Santa Monica, Calif.
Missile and Space Systems Div.
INVESTIGATE METHODS OF FABRICATING AND JOINING LARGE SANDWICH SEGMENTS FOR FORMING COMMON DOMES.
Monthly report, 1-31 Oct 64,
by A. C. Robertson. 1964, 18p SM-48069
Contract NAS8-11648
NASA CR-62867
Unclassified report

Descriptors: (*Sandwich construction, Joining), (*Structures, Joining).

N65-26256 Field 13A, 22B
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
DESIGN ANALYSIS AND GENERAL CHARACTERISTICS OF FLAT-PLATE CENTRAL-FIN-TUBE SENSIBLE-HEAT SPACE RADIATORS,
by Arthur V. Saule, Richard P. Krebs, and Bruce M. Auer. Jun 65, 62p NASA-TN-D-2839
Unclassified report

Descriptors: (*Radiators, Space propulsion), (*Space propulsion, Radiators).

N65-26257 Field 13A, 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
COMPUTER PROGRAM DETAILS FOR DESIGN OF SENSIBLE-HEAT SPACE RADIATORS,
by Bruce M. Auer and Arthur V. Saule. Jun 65, 36p
NASA-TN-D-2840
Unclassified report

Descriptors: (*Radiators, Space propulsion), (*Space propulsion, Radiators).

N65-26599 Field 13K, 20D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
DESIGN AND OVERHALL PERFORMANCE OF A TWO-STAGE AXIAL-FLOW PUMP WITH A TANDEM-ROW INLET STAGE,
by Donald M. Sandercock and James E. Crouse. Jun 65, 30p NASA-TN-D-2879
Unclassified report

Descriptors: (*Propeller pumps, Fluid mechanics), (*Fluid mechanics, Propeller pumps).

N65-26638 Field 13H, 13E
CFSTI Prices: HC$0.25 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.

A TECHNIQUE FOR JOINING AND SEALING DISSIMILAR MATERIALS.
Technology utilization rept.
Jun 65, 8p NASA-SP-5016
Unclassified report

Descriptors: (*Seals(Stoppers), Pressure), (*Metal seals, Cryogenics), (*Joining, Metal seals), (*Low-temperature alloys, Metal seals).

N65-26652 Field 13K
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
DEVELOPMENT OF A HEMISPHERICAL METAL DIAPHRAGM FOR SINGLE-CYCLE LIQUID-METAL POSITIVE EXPULSION SYSTEMS,
by Sol Gorland. Jun 65, 19p NASA-TN-D-2884
Unclassified report

Descriptors: (*Diaphragms(Mechanics), Liquid metal pumps), (*Liquid metal pumps, Diaphrams-(Mechanics).

N65-26654 Field 13A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
PERFORMANCE OF MULTIPLE-CHAMBER ARC HEATER WITH FOUR MAGNETICALLY SPUN DIRECT-CURRENT ARCS,
by Donald R. Boldman, James P. Campbell, and Paul C. Simon. Jun 65, 17p NASA-TN-D-2891
Unclassified report

Descriptors: (*Heaters, Electric arcs), (*Electric arcs, Heating elements).

N65-27811 Field 13K, 20D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
SOME VISUAL OBSERVATIONS OF CAVITATION IN ROTATING MACHINERY,
by Richard F. Soltis. Jul 65, 17p NASA-TN-D-2681
Unclassified report

Descriptors: (*Cavitation, Turbopumps), (*Turbopumps, Cavitation).

NMI-2523 Field 13H, 18J
CFSTI Prices: HC$2.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY. HOT CO-EXTRUSION OF URANIUM MONOCARBIDE FUEL ELEMENTS.
Summary technical rept., 1 Jul 61-30 Oct 62,
by J. G. Hunt and P. Loewenstein. 8 Sep 64, 38p
Contract AT(30-1)-1565
Unclassified report

Descriptors: (*Uranium, Carbides), (*Extrusion, Reactor fuels), Claddings, Hot working, Powder, Fuel elements.

Patent 3,199,221 Field 13H, 6H

APPARATUS FOR USE IN FREEZE DEHYDRATION.
Patent assigned to Army,
by Ferdinand P. Mehrlich and Raymond R. Haugh.
10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Freeze drying, Industrial equipment), (*Dehydrated foods, Freeze drying), Heating elements, Food, Meat, Processing, Patents.

The combined heater and rack is for use in the freeze dehydration of meat and other foods. The rack or holder is for shaping, holding and heating the meat. The structure includes a plurality of thermoelectric heating elements of angle shape in transverse section disposed to define a material holding space there between of sinusoidal or undulatory shape in transverse section.

Patent 3,199,288 Field 13G

EXPLOSIVELY ACTUATED PISTON DRIVER.
Patent assigned to Navy,
by Joseph A. Nahas. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Explosive actuators, Locking fastener devices), (*Locking fastener devices, Explosive actuators), Springs, Patents.

The explosively actuated device is used to drive mechanical loads, to operate relays, latches, solenoids, and the like and more particularly to an explosively actuated piston employed in one shot applications. A unique piston locking device is used in combination with an explosively actuated piston driver which prevents linear travel of the piston to its unfired condition once the driver has been actuated.

Patent 3,199,410 Field 13K

MULTI-FUNCTION CONTROL VALUE APPARATUS.
Patent assigned to Navy,
by Ralph F. Hereth. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Hydraulic valves, Patents), Multiple operation, Fluids, Pressure, Solenoids.

The fluid valve apparatus is used for controlling the movement of a load between two or more fixed positions. A single spool is utilized. Fluid pressure is selectively applied to one or the other end portions of a valve stem, the direction of the pressure preferably being controlled by a sole-noid-operated pilot valve. The valve stem extends through a main control valve casing and, in particular, through a so-called metering fluid chamber and through a sensing fluid chamber. A pressure inlet and outlet are provided.

Patent 3,200,491 Field 13H, 11D

CLADDING PROCESS.
Patent assigned to AEC,
by David E. Walker and Robert A. Noland. 17 Aug 65
Available from Commissioner of Patents, Unclassified patent
Washington, D.C., 20231, $0.50

Descriptors: (*Cladding, Metals), Bonding, Protective treatments, Uranium, Zirconium, Sandwich construction, Resistance welding, Pressure.

Protective metal layers are bonded to a metal-containing core. The process is used in making aircraft engines and control rods for nuclear engines and control rods for nuclear reactors. Bonding and reduction to predetermined dimensions and desired heat treatment are carried out in one step simultaneously. The cladding is accomplished by mechanical pressure and resistance welding.

Patent 3,200,706 Field 13E

GAS ACTUATED BOLT DISCONNECT.
Patent assigned to NASA,
by William H. Kinard. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Disconnect fittings, Bolts), (*Explosive actuators, Disconnect fittings), Patents, Explosive initiators.

The gas actuated bolt disconnect is utilized for detachably securing two parts that are desired to be releasably connected. These parts may include, for example, a cable and weight, two ends of a tension cable used to connect a jettisonable satellite to a rocket propelling vehicle, or for connecting the various stages of a rocket vehicle, and the like. A bolt assembly is provided in which the gaseous charge forces are confined wholly within the assembly. Disconnect takes place without the danger of shrapnel damage to adjacent structure.

Patent 3,200,919 Field 13I

REVERSIBLE DOUBLE-DRIVE CLUTCH.
Patent assigned to Agriculture,
by James P. Lanigan, Eugene F. Wallace, James I. Kotter and Harold L. Salaun, Jr. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Torque couplings, Multiple operation), (*Clutches, Drives), (*Drives, Multiple operation), Variable-speed drives, Gears, Patents.

Apparatus is disclosed wherein a single driving source is caused to shift its driving torque from a first driven system to a second driven system by changing the direction of rotation of the driving source. It is related to patent No. 3,158,244. The tendency of the clutch to 'lock-up' when subjected to high torque, slow speed transmission is eliminated.

Patent 3,201,191 Field 13H, 18J, 11F

SEPARATION AND RECOVERY OF URANIUM FROM URANIUM-ALUMINUM ALLOYS.
Patent assigned to AEC,
by Herman S. Gile. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Uranium, Recovery), Reactor fuel rods, Uranium alloys, Aluminum alloys, Alkali metal compounds, Hydroxides, Nitrates, Nitrites, Aluminates, Barium compounds, Oxides, Aluminum, Patents.

Uranium is separated from aluminum contained in uranium-aluminum alloys. The alloy is reacted with an aqueous solution of alkali metal hydroxide, alkali metal nitrate and alkali metal nitrite. Barium nitrate isadded to the solution formed and an alkali aluminate-containing solution is separated from a uranium oxide-containing residue.

Patent 3,201,560 Field 13A, 9C

ELECTRIC-ARC HEATER.
Patent assigned to NASA,
by Robert F. Mayo, Milton A. Wallio and William L.Wells. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Electric arc, Heaters), Magnetic fields, Electrical networks, Coils, Patents.

Electric-arc heaters are used as a drive unit for test tunnels and magneto-hydrodynamic devices and for the heating of gases for propulsion purposes. The structure includes a pair of concentric, coaxially extending electrodes connected by an electrical circuit including a power source. A field coil is positioned about the electrodes.

Patent 3,201,838 Field 13E

ROPE COUPLING.
Patent assigned to Army,
by John S. Brown. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Cordage, Couplings), (*Couplings, Cordage), Shelters, Patents.

The rope coupling is useful in the anchoring systems of air-supported shelters. The coupling device adjustably and releasable couples a ground anchor cable to the catenary cable if the shelter. The device prevents fraying of the catenary cable.

Patent 3,202,465 Field 13I

THRUST BEARINGS.
Patent assigned to AEC,
by Frank C. Rushing. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Thrust bearings, Shafts), Patents, Rotation, Surfaces, Lubrication.

The thrust bearing may be associated with the shaft of a high-speed centrifugal separator. The bearing affords broad cooperating bearing surfaces for operating speeds of a rotating shaft and smaller surfaces for use during starting of the shaft and stopping of the shaft.

PB-168 073 Field 13H
CFSTI Price: MF$1.00

National Bureau of Standards, Washington, D. C.
SYSTEMS ENGINEERING IN CERAMICS. PROCEEDINGS OF AN AMERICAN CERAMIC SOCIETY SYMPOSIUM, CHICAGO, ILL., APRIL 19, 1964.

1 May 65, 137p
Miscellaneous publication NBS-MP-267
Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $2.00, as C13.10:267.

Descriptors: (*Ceramics materials, Symposia), (*Systems engineering, Ceramic materials), (*Symposia, System engineering), Processing, Control systems, Computers, Statistical analysis, Meters, Feedback, Industrial research.

Contents: Systems engineering and modern engineering design, basis concepts of systems engineering, process control in the ceramic industry, application of computers in design and control of systems, statistical methods in systems design, systems of interest to ceramic engineers.

PB-168 305 Field 13B, 13F, 13M
CFSTI Prices: HC$4.00 MF$1.00

Dames and Moore, New York.
PRIORITIES I, II, III, IV AND IV-A, FOUNDATION INVESTIGATION, PROPOSED RAPID TRANSIT SYSTEM, WASHINGTON, D. C., FOR THE NATIONAL CAPITAL TRANSPORTATION AGENCY.
Rept., phase 2.
1963, 146p
Unclassified report

Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.

Descriptors: (*Civil engineering, Underground structures), (*Transportation, District of Columbia), (*Underground structures, Railroads), (*Railroads, Underground structures), Foundations(Structures), Engineering geology, Soil mechanics, Well logging, Graphics, Urban planning.

The purposes of this investigation were to: (1) determine the subsurface soil, rock and ground water conditions at locations along the proposed routes; (2) estimate the lateral earth pressures during construction in continually braced cuts and the lateral earth pressures on subway sections after construction; (3) estimate earth roof loads on underground sections; (4) provide general recommendations relative to construction problems associated with soil stability during construction, water seepage and areal settlements due to dewatering work areas; and (5) determine the most suitable types of foundation support and develop foundation design criteria.

PB-168 311 Field 13B, 6F
CFSTI Prices: HC$3.00 MF$0.75

South Dakota State Dept. of Health, Pierre.
APPRAISAL OF AIR POLLUTION IN SOUTH DAKOTA.
Rept. for Oct 61-May 62,
by Charles E. Carl and G. Lee Christensen.
Aug 62, 72p
Unclassified report

Prepared in cooperation with Public Health Service, Washington, D. C. Div. of Air Pollution.

Descriptors: (*Public health, Air pollution), (*Air pollution, South Dakota), Atmosphere, Contamination, Smokes, Waste gases, Combustion products, Wastes-(Industrial), Meteorology, Climatology, Terrain, Ecology.

A growing concern over the increasing number of public complaints about air pollution led the South Dakota Legislative Research Council to request that the State Department of Health conduct a state-wide air pollution survey. The objects of this survey were threefold: to determine the extent of air pollution in South Dakota; to evaluate presently available means for coping with the problem; and if necessary to recommend any steps required to restore and preserve the State's air resources. The State Department of Health requested the assistance of the United States Public Health Service in conducting this survey. Arrangements for the survey were completed in September 1961 and the survey itself, consisting of questionnaires, field inspections, and a review of existing information commenced in October 1961. Information gathered from published data and field trips indicates that air pollution emanates from domestic sources, (space heaters and backyard trash burners); municipal sources, (burning dumps and septic sewage); transportation sources, (mostly motor vehicles); and industrial sources, (agriculture, manufacturing, and electric power generation).

PB-168 312 Field 13B, 6F
CFSTI Prices: HC$2.00 MF$0.50

Georgia Dept. of Public Health, Atlanta.
AIR POLLUTION IN GEORGIA: A COOPERATIVE STATEWIDE SURVEY,
by Rudolph P. Lewis, Samuel B. McKee, Frank A. Bell, Jr., and Horace S. Carter. Apr 62, 37p
Unclassified report

Prepared in cooperation with Public Health Service, Cincinnati, Ohio, and Weather Bureau, Atlanta, Ga.

Descriptors: (*Public health, Air pollution), (*Air pollution, Georgia), Atmosphere, Contamination, Smokes, Waste gases, Combustion products, Wastes-(Industrial), Meteorology, Climatology, Terrain, Ecology.

In 1959 a survey of industrial air pollution in Georgia, carried out by the Georgia Department of Public Health, showed the existence of a number of significant air pollution problems due to emissions from industrial plants. Emission of air pollutants has been increasing in Georgia from a variety of sources including automotive vehicles, burning refuse dumps, home and commercial heating plants and other sources, in addition to industrial sources. These increased emissions have resulted in a mounting number of air pollution problems. Therefore, a Statewide survey was undertaken to provide a current assessment of air pollution in Georgia and to develop recommendations for necessary action.

PB-168 313 Field 13B, 6F
CFSTI Prices: HC$3.00 MF$0.75

Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION MEASUREMENTS IN INDIANAPOLIS, JUNE-JULY 1963,
by Seymour Nochheiser and Raymond E. Wetzel.
Jul 64, 68p
Unclassified report

Research done in cooperation with Bureau of Air Pollution Control, Indianapolis, Inc.
Available copy will not permit fully legible reproduction.

Descriptors: (*Air pollution, Urban areas), (*Public health, Air pollution), Indiana, Atmosphere, Contamination, Smokes, Waste gases, Combustion products, Wastes-(Industrial), Gas analysis, Meteorology, Climatology, Ecology.

A mobile air sampling laboratory was used. This laboratory, designed and constructed by the Technical Assistance Branch, Division of Air Pollution, Public Health Service, contains continuous automatic equipment for monitoring air quality, manual air sampling equipment, meteorological instrumentation, and laboratory facilities. Some of the data obtained, such as concentration range of air contaminants, relationships among levels of air pollutants, and the relationship of meteorological measurements and air pollution measurements, are presented here. Detailed tabulations of air pollution and meteorological measurements are given in the Appendix.

PB-168 314 Field 13B, 6F
CFSTI Price: HC$0.50

Public Health Service, Washington, D. C. Div. of Air Pollution.
AIR POLLUTION IN THE NATIONAL CAPITAL AREA,
by Gene B. Welsh. Jul 62, 49p Pub. no. 955
Unclassified report

Prepared in cooperation with District of Columbia Department of Public Health; Maryland State Department of Health, and Virginia Department of Health.
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.35, as FS2.2:A17/23.

Descriptors: (*Air pollution, District of Columbia), (*Public health, Air pollution), Atmosphere, Contamination, Combustion products, Waste gases, Wastes-(Industrial), Wastes(Sanitary Engineering), Meteorological parameters, Climatology.

At the request of the District of Columbia Department of Public Health and with the cooperation of the Maryland State Department of Health and the Virginia Department of Health, the Public Health Service conducted an appraisal of factors relating to air pollution in the Washington Metropolitan Area. This appraisal was undertaken to determine the extent of the existing and potential air pollution problem and control activities, and to develop general recommendations for activities to meet present and future air pollution problems. This report is an analysis of information collected relating to sources of pollutants, indications of pollution levels, and status of local activities in the air pollution field.

PB-168 318 Field 13J, 20
CFSTI Prices: HC$2.00 MF$0.50

California Univ., Berkeley. Inst. of Engineering Research.
WIDE SHIP PLATING WITH SMALL INITIAL DEFLECTION UNDER EDGE COMPRESSION AND LATERAL LOAD,
by Hsien-Yun Jan. Jul 65, 43p Rept. no. NA-65-2
Contract MA2620
Unclassified report

Descriptors: (*Ship plates, Loading(Mechanics)), (*Loading(Mechanics), Ship plates), Metal plates, Deflection, Deformation, Theory, Stressed, Mathematical analysis, Numerical methods and procedures, Differential equations, Structures.

The report deals with the elastic response of slightly deformed plating to the combined action of lateral and planar compressive loads. A family of general equations are derived from Marguerre's fundamental equations, and a set of numerical solutions are obtained for the simply supported plate. Influence of the shape of initial deflection is examined. Substitution of the initial deflection by a virtual lateral load is discussed.

PB-168 340 Field 13B, 7E
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
RADIO-CHEMICAL DOSAGE OF 90Sr IN LARGE VOLUMES OF DRINKING WATER. (Dosage Radiochimique du90Sr sur des Volumes Importants d'Eaux Potables),
by Lucien Jeanmaire, Francois Patti, and Denise Bullier.
Aug 65, 25p Rept. no. CEA-R-2844
Unclassified report

Text in French, attached summary in English.

Descriptors: (*Water supplies, Radiological dosage), Strontium, Radioactive isotopes, Quantitative analysis, Nitric acid, Chemical precipitation, France.

The method includes (1) fixing on a resin of all the cations present in the water, (2) elution using 5N nitric acid and precipitation of strontium as the carbonate, (3) concentration of the strontium using the fuming nitric acid method, (4) purification of the strontium on a resin by selective elution with ammonium citrate, (5) the strontium-90 is measured by separation at the Y90 equilibrium in the form of the oxalate which is then counted. The concentration of the radio-activity starting from large volumes (100 l) is generally tedious but this method which makes use of a fixation on a cationic resin makes it very simple. (Author)

PB-168 357 Field 13L, 15C, 18F, 11C, 11H
CFSTI Prices: HC$3.00 MF$0.75

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
FIRE INCIDENCE AND INHIBITION; A REPORT BIBLIOGRAPHY.
May 65, 84p
Unclassified report

See also PB-168 356.

Descriptors: (*Fire safety, Bibliographies), (*Civil defense systems, Fires), Thermal radiation, Nuclear weapons, Nuclear explosion damage, Fire-resistant textiles, Heat-resistant materials, Flame propagation, Flammability, Aircraft fires, Radiation damage, Hydraulic fluids, Forest fires, Spacecraft, Shelters, Abstracting, Subject indexing.

The bibliography is one of two computer-produced bibliographies in the areas of fire incidence, fire inhibition, and civil defense, compiled by the Clearinghouse for Federal Scientific and Technical Information. It includes only those reports accessioned by the Clearinghouse since July 1964 that are indexed in the Defense Documentation Center computer. The purpose of the bibliography is to present to those in the field of fire research and civil defense an indication of the current reports available to them through the Clearinghouse.

PB-168 382 Field 13B, 4B, 13L
CFSTI Prices: HC$2.00 MF$0.50

National Hurricane Research Project, Weather Bureau, Washington, D. C.
A MODEL HURRICANE PLAN FOR A COASTAL COMMUNITY.
Apr 59, 35p Rept. no. NHRP-28
Unclassified report

Prepared in cooperation with Corps of Engineers, U. S. Army in accordance with the authorization of PL 71, 84th Congress, First Session.

Descriptors: (*Urban planning, Tropical cyclones), (*Weather forecasting, Tropical cyclones), (*Tropical cyclones, Civil defense systems), (*Hurricane tracking, Urban areas), Storms, Disasters, Warning systems, Seacoast, Atlantic Ocean, Mexico Gulf, Marine meteorology.

The hurricane preparedness plan presented herein is for a fictitious city, Homeport, in Achilles County, on the Atlantic Coast. The plan is equally applicable elsewhere. The plan deals with real hazards associated with hurricanes and shows what might be done to minimize death and destruction.

PB-168 437 Field 13F, 12B, 5C
CFSTI Prices: HC$5.00 MF$1.00

California Univ., Los Angeles. Dept. of Engineering.
PROJECT TRANSIM (TRANSPORTATION SIMULATOR).
Phase 1 rept.,
by A. M. Feiler, F. C. Toscano, and E. O. Fisher,
Jul 64, 167p Rept. no. 64-44
Contract Cc6220

Unclassified report

Descriptors: (*Transportation, Simulators), (*Urban planning, Transportation), Socialogy, Economics, Commerce, Distribution(Economics), Cargo, Roads, Railroads, Shipping(Marine), Operations research, Mathematical models, Programming(Computers).

This report covers phase I of the TRANSIM program, an analytical methodology which provides the means by which transportation interchange problems can be analyzed on a systems basis. TRANSIM is based on digital computer simulation techniques. The TRANSIM methodology is generalized so it can be applicable to a wide range of interchange situations covering different transporation modes, urban situations, traffic levels and composition and other situation parameters. It consists of two basic components: (1) The TRANSIM Simulator, which includes the general purpose digital computer program and is applicable to the simulation of any interchange system, and (2) the specifications for the set of data inputs which formulates the problem and describes the parameters for a particular interchange situation to be studied. The TRANSIM simulation model of a specific transportation interchange is formulated when the Simulator and set of data inputs are combined.

PB-168 484 Field 13B, 2D
CFSTI Prices: HC$4.00 MF$1.00

Louisiana State Univ., Baton Rouge. Div. of Engineering Research.
OPTIMUM UTILIZATION AND SELECTION OF MOWERS FOR HIGHWAY RIGHT OF WAYS,
by Allen L. Cox, Darryl C. Rester, and Mansel M. Mayeux. 1965, 147p
Engineering research bulletin no. ERB-84
Proj. 736 00 18

Unclassified report

Descriptors: (*Maintenance equipment, Roads), (*Roads, Maintenance), Grasses, Tractors, Transportation, Machines, Costs, Linear programming, Optimization, Mathematical models, Herbicides, Statistical analysis, Programming(Computers), Time studies, Louisiana.

A study of roadside mowing operations was conducted in Louisiana. The objective of the study was to determine the optimum size and combination of mowers for roadside mowing. The literature indicated that very little research had been done on the subject. However, there was general agreement among highway maintenance personnel on which type of mower was best for each roadside condition. This indicated that a variety of mowers of different sizes and widths were required for roadside mowing. After studying optimization procedures used in industry, the authors concluded that linear programming methods could be applied to the problem of utilizing and selecting roadside mowers. The Brittany Maintenance Unit, located in the Louisiana Department of Highways' District 61, was selected as a parish model. The roadsides in the parish model were surveyed to determine the area, physical dimensions and the number and types of obstructions within each control section. The roadsides were classified for mowing. Time and motion studies were conducted to determine the work day length and field capacities of the mowers as they operated on the different classes of roadsides. This information was used to determine the mowing costs per acre.

SwRI-1228-50 Field 13I
CFSTI Prices: HC$3.00 MF$0.75

Southwest Research Inst., San Antonio, Tex.
FUNDAMENTAL INVESTIGATION OF LIQUID-METAL LUBRICATED JOURNAL BEARINGS.
Quarterly technical rept. no. 3,
by R. A. Burton, H. J. Carper, Y. C. Hsu, and P. A. Hunter. 14 Jan 65, 60p
Contract AT(11-1)-1228

Unclassified report

Descriptors: (*Journal bearings, Liquid metals), (*Liquid metals, Journal bearings).

TID-21624 Field 13H
CFSTI Prices: HC$1.00 MF$0.50

Utah Univ., Salt Lake City. Inst. of Metals and Explosives Research.
A NEW APPROACH FOR THE EVALUATION OF SHRINKAGE DURING SINTERING.
Technical rept. no. 26,
by A. U. Daniels and M. E. Wadsworth. 1 Jan 65, 18p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Powder metals, Sintering), (*Sintering, Powder metals).

14. Methods and Equipment

AD-417 674 Field 14B, 13H, 9A
CFSTI Prices: HC$2.00

General Electric Co., Syracuse, N. Y. Heavy Military Electronics Dept.
SOLDERABILITY OF TERMINALS AND AGING.
Quarterly progress rept. no. 3, 1 Apr-30 Jun 63,
by J. A. De Vore. 30 Jun 63, 31p
Contract DA36 039AMC00008E, Task 702

Unclassified report

Descriptors: (*Aging(Materials), Test methods), (*Electronic equipment, Soldering), (*Soldering, Test methods), (*Electric terminals, Soldering), Standards, Acids, Vapors, Humidity, Organic compounds, Organic solvents, Dyes, Heating, Wire, Military requirements.

The objective of this project is to develop test methods for the solderability of lugs, tabs, stranded wire, etc., and to develop a simulated short time aging test to duplicate 6 or 12 months natural aging of wires, lugs, etc. which are

to be soldered. This quarterly report discusses the investigation of five artificial aging methods. These are two types of acid fumes, humidity per Mil-Std-202B, Method 103, solvent fumes and epoxy fumes. Also discussed are data collected on the development of a solderability test and the best methods available to date. (Author)

AD-453 090 Field 14E, 8B, 14B
CFSTI Price: HC$2.00

Ballistic Research Labs., Aberdeen Proving Ground, Md.
THE BRL BALLISTIC CAMERA SYSTEM,
by D. Reuyl, D. Menne, and H. Poetzschke. Aug 64,
36p Rept. no. BRL-1260
N65 18479
Unclassified report

Descriptors: (*Ballistic cameras, Photographic recording systems), Systems engineering, Photogrammetry, Measurement, Data, Optimization, Position finding, Optical tracking, Phototheodolites, Camera shutters, Camera lenses, Programming(Computers), Geodesics, Instrumentation, Grenades, Airburst, Aerial gunnery, Satellites(Artificial), Test facilities.

This report describes an optical instrumentation system of high metric accuracy. Early photogrammetric work leading to the development of this system is mentioned briefly. The optical and mechanical characteristics of the position measuring system and the mechanical and electronic details of the synchronization system are presented. The theory underlying the data acquisition and reduction is described briefly and methods of measurement and computer programming are outlined. Selected examples of application of the system are presented to illustrate the wide range of usefulness. (Author)

MLM-1216 Field 14B, 18B
CFSTI Prices: HC$2.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
MOUND LABORATORY PROGRESS REPORT FOR AUGUST 1964,
by J. F. Eichelberger, G. R. Grove, and L. V. Jones.
20 Aug 64, 45p Unclassified report
Contract AT(33-1)-GEN-53
Descriptors: (*Nuclear physics laboratories, Reports), (*Isotope separation, Nuclear physics laboratories).

N65-18197 Field 14B
CFSTI Prices: HC$5.00 MF$1.00

Wyle Labs. Inc., El Segundo, Calif.
LIQUID HYDROGEN MASS FLOWMETER EVALUATION. Final rept.,
by L. N. Mortenson, H. R. Wheelock, and F. Robinett.
Jan 65, 166p
Contract NAS8 1526 Unclassified report
NASA CR-60990
Descriptors: (*Flowmeters, Liquefied gases).

N65-23819 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
APPARATUS FOR STUDYING BALL SPINNING FRICTION,
by Steven T. Miller, Richard J. Parker, and Erwin V. Zaretsky. May 1965, 13p NASA-TN-D-2796
Unclassified report

Descriptors: (*Friction, Roll), (*Test equipment, Friction).

N65-26254 Field 14E, 20L
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SOLID STATE, SEQUENTIAL CAMERA TRIGGER CIRCUITS,
by John F. Fitz. Jun 65, 9p NASA-TN-D-2826
Unclassified report

Descriptors: (*Camera controls, Trigger circuits), (*Trigger circuits, Camera controls).

N65-28805 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
A STUDY OF GAS INJECTION IN THE BOUNDARY LAYER OF A HYPERSONIC WIND TUNNEL TO EXTEND THE USEFUL OPERATING RANGE,
by John B. McDevitt. Jul 65, 33p
NASA-TN-D-2935
Unclassified report

Descriptors: (*Hypersonic wind tunnels, Operation), (*Boundary layer, Injection).

N65-28958 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
CHARACTERISTICS OF MAJOR ACTIVE WIND TUNNELS AT THE LANGLEY RESEARCH CENTER,
by William T. Schaefer, Jr. Jul 65, 43p
NASA-TM-X-1130
Unclassified report

Descriptors: (*Wind tunnels, Reviews).

Patent 3,199,340 Field 14B, 22B

ACCELEROMETER WITH FM OUTPUT.
Patent assigned to NASA,
by Raymond G. Hartenstein and Edward J. Kirchman.
10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Accelerometers, Frequency modulation), Resistors, Voltage, Transistors, Circuits, Spacecraft, Strain gages, Patents.

The accelerometer directly produces a frequency modulated output which can be transmitted. It can be used on space vehicles. A resistor, a variable voltage source, a PNPN transistor having a negative resistance characteristic and two strain sensitive devices are connected in a series circuit.

Patent 3,199,343 Field 14B, 21C

ELECTRIC PROPULSION ENGINE TEST CHAMBER.
Patent assigned to NASA,
by James H. Childs, Warren D. Rayle and Jack Grobman. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Electric engines, Electric porpulsion), (*Test facilities, Electric engines), Patents, Vacuum apparatus, Space propulsion, Hydrogen, Ion engines, Plasma engines, Space environmental conditions.

The testing facility is for handling both ion engines and plasma jet engines which are designed for space flight. The structure reduces the number of oil diffusion pumps associated with a vacuum facility for testing the engines which use hydrogen for the propellant. The propellant is pumped cryogenically.

Patent 3,200,635 Field 14B

APPARATUS FOR DETERMINING MELTING POINTS.
Patent assigned to Commerce,
by Clyde L. McDaniel. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Test equipment, Transition temperature), (*Melting, Transition temperature), Patents, Resistance thermometers, Determination.

The melting point of materials is determined by electrical resistance measurements. The material is melted in a crucible. A novel electrode is used for measuring. The electrode is dipped into the melted material and is lifted slightly above the material. The cone-shaped amount of material, held in place by surface tension, is the sample utilized in the measurement. The electrode is hollow and may be rapidly cooled. The sample is cooled and then melted to determine the melting point.

Patent 3,201,586 Field 14B, 7B, 18B

METHOD AND APPARATUS FOR RADIOACTIVE GAS ANALYSIS USING NEUTRONS OF TWO ENERGY LEVELS.
Patent assigned to AEC,
by Eugene T. Booth. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Radioactive isotopes, Analysis), (*Gases, Radioactive isotopes), Gases, Uranium, Neutrons, Electrodes, Patents.

The apparatus is used for determining the isotopic composition of a gaseous mixture of isotopes such as the isotopes of uranium. The apparatus includes a set of electrodes. The gas is subjected to a flux of neutrons of one energy level and then to a flux of neutrons of another energy level. An electrical circuit is provided for measuring the pulse current rate of flow between the electrodes. The measurements are correlated to determine the composition of the gas.

Patent 3,201,980 Field 14B

THRUST DYNAMOMETER.
Patent assigned to NASA,
by Siegfried Hansen. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Dynamometers, Thrust), (*Thrust meters, Ion engines), Patents, Measurement.

The dynamometer is for measuring the thrust produced by an ion reaction engine which is used in propulsion of space ships. The engine is supported on a platform during the test. The deflection of the platform is detected, and this deflection is utilized to obtain a measure of engine thrust.

Patent 3,201,989 Field 14B

DIFFERENTIAL PRESSURE TRANSDUCER.
Patent assigned to Navy,
by Henry C. Beck. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Transducers, Pressure), (*Depth indicators, Underwater equipment), Patents, Measurement, Pressure gages.

The transducer is used in oceanographic work for measuring small changes in depth. A differential piston is opposed by a spring to drive an adjustable valve which closes one port of a low-range differential pressure transducer at a predetermined point of high pressure. A second port of the differential pressure transducer is always exposed to the ambient environment (sea water) so that differences between the ambient pressure and the pre-determined pressure are measured.

PB-167 630 Field 14E
CFSTI Prices: HC$0.50 MF$0.50

Federal Council for Science and Technology,
Washington, D. C.
FEDERAL MICROFICHE STANDARDS.
Ed. no. 1.
Sep 65, 19p
Unclassified report

Supersedes PB-167 630, ed. 1 dated Jun 65.

Descriptors: (*Photographic techniques, Standards), (*Microfilm, Standards), United States Government, Reports, Processing, Photographic film.

Contents:
Dimensions and general specifications
Master copy (film obtained from camera)
distribution copy (michrofiche duplicates)
Utilization of grid areas
Microfiche sheet 1-instructions applicable to all documents
Microfiche trailer sheets-instructions applicable to all documents
Special instructions for unclassified-unlimited documents
Special instructions for classified and unclassified-limited distribution documents
Exhibits
Microfiche dimensions
Grid area coordinates and arrangement of information on first microfiche sheet
Relation of first and trailer microfiche sheets for an unclassified report
Titles of ASA standards cited.

PB-168 320 Field 14B
CFSTI Prices: HC$3.00 MF$0.75

Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
CALIBRATION PROCEDURE CHANGE NOTICE BOOK.
Rept. for 1 Jan 62-1 Jul 63, on Navy Calibration Program.
1 Jul 63, 80p Unclassified report

Descriptors: (*Instrumentation, Calibration), (*Calibration, Instrumentation), Meteorological instruments, Instruction manuals, Handbooks, Test equipment.

PB-168 420 Field 14B, 4A, 22C
CFSTI Prices: HC$1.25 MF$0.50

Naval Research Lab., Washington, D. C.
REPORT OF NRL PROGRESS.
Aug 65, 42p
Unclassified report

Descriptors: (*Naval research, Reports), (*Solar radiation, Monitors), (*Satellites(Artifical), Position finding), X rays, Display systems, Coatings, Vibrators-(Mechanical), Transducers, Heat treatment, Corrosion inhibition, Stresses, Neutron scattering, Ionospheric propagation, Lasers, Acoustics.

Complete papers: Solar X-ray monitoring during the IQSY; and SPAD, an experimental satellite position prediction display. Summaries are given of research in the following fields: applications research, chemistry, mechanics, metallurgy and ceramics, nuclear and atomic physics, radio, solid state physics, and sound.

SB-544 Field 14B, 11F, 11E, 11C, 11I 11J, 9A, 10C, 21H

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
LIFE TESTING OF MATERIALS.
Price list, selective bibliography of Government research repts. and translations.
Jul 65, 20p Unclassified report

Available free from the Clearinghouse.

Descriptors: (*Materials, Life expectancy), (*Life expectancy, Tests), (*Bibliographies, Materials), Small tools, Cutting tools, Wear resistance, Statistical analysis, Test methods, Aging(Materials), Degradation, Corrosion, Electronic equipment, Coatings, Textiles, Elastomers, Electrical equipment, Rotor motors, Storage.

Lists 300 references added to the CFSTI collection through July 1965. Material is arranged in the following categories: Accelerated Life Testing; Tool Wear Testing; Statistical Analyses; and Life Expectancy Testing, General. Covers accelerated test procedures on electronic components, accelerated weathering of paints and organic coatings on metals; accelerated aging of fabrics and rubber; accelerated deterioration of elastomers; accelerated corrosion of metals; life expectancy of cutting tools; statistical analyses and tables for life testing; electronic equipment life prediction tests; life tests on batteries and generators; shelf life tests of rocket motors; fatigue resistant structures among other subjects.

SB-545 Field 14B

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
ENVIRONMENTAL TESTING (MATERIALS).
Price list, selective bibliography of government research repts. and translations for 1958-Jul 65.
Jul 65, 12p Unclassified report

Available free from the Clearinghouse.

Descriptors: (*Environmental tests, Materials), (*Bibliographies, Environmental tests), (*Materials, Environmental tests), Test equipment, Test methods, Tropical tests, Degradation.

Lists 148 references on environmental testing of materials, including tropical environment. Covers research on capabilities for testing, atmospheric exposure tests, field tests on concrete, long-term storage tests, chemical environments on ceramics, testing in marine conditions, tropical environment effects on materials, among other subjects.

SC-TM-64-1281 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
FORCE TEST OF A 2-CALIBER TANGENT OGIVE SHAPE AT MACH 2.0 (PROGRAM III-100),
by Roger N. Everett. Oct 64, 22p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Wind tunnel models, Ogives), (*Ogives, Force(Mechanics)).

SwRI-1228-43 Field 14B, 11F
CFSTI Prices: HC$3.00 MF$0.75

Southwest Research Inst., San Antonio, Tex.
STUDIES OF THE FATIGUE STRENGTH OF PRESSURE VESSELS. (1) CYCLIC PRESSURE TESTS OF LARGE SIZE PRESSURE VESSELS. (2) LOW CYCLE FATIGUE TESTING OF ONE-HALF SCALE MODEL PRESSURE VESSELS. (3) EFFECT OF WELD DEFECTS ON THE FATIGUE STRENGTH OF A302B STEEL.
Progress rept. no. 11,
by A. G. Pickett, S. C. Grigory and A. R. Whitting.
16 Nov 64, 68p SwRI-1228-44, SwRI-1228-45
Contract AT(11-1)-1228
Unclassified report

Descriptors: (*Pressure vessels, Fatigue-(Mechanics)), Strength, Welds, Steel.

15. Military Sciences

PB-168 356 Field 15C, 18H, 13L
CFSTI Prices: HC$3.00 MF$0.75

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
CIVIL DEFENSE; A REPORT BIBLIOGRAPHY.
May 65, 88p
Unclassified report

See also PB-168 357.

Descriptors: (*Civil defense systems, Bibliographies), (*Fire safety, Bibliographies), Civil defense personnel, Shelters, Radiation hazards, Radioactive fallout, Decontamination, Nuclear warfare, Biological warfare, Chemical warfare, Countermeasures, Fires, Reports, Abstracting, Subject indexing.

16. Missile Technology

AD-445 278 Field 16D, 1A
CFSTI Prices: HC$2.00

Army Missile Command, Redstone Arsenal, Ala.
Aerodynamics Section.

THE EFFECT OF NOSE SHAPE AND AFTERBODY LENGTH ON THE NORMAL FORCE AND NEUTRAL POINT LOCATION OF AXISYMMETRIC BODIES AT MACH NUMBERS FROM 0.80TO 4.50,
by Donald J. Spring. 15 Jul 64, 39p
Rept. no. RF-TR-64-13

Unclassified report

Descriptors: (*Guided missiles, Aerodynamics characteristics), (*Nose cones, Aerodynamic characteristics), Axially symmetric flow, Subsonic characteristics, Transonic characteristics, Supersonic characteristics, Slender bodies, Model tests, Conical bodies, Ogives.

The experimental results for the supersonic Mach numbers 1.50 to 4.50 are compared with the second-order shock expansion theory of Syverston and Dennis. The comparisons indicate satisfactory agreement for all configurations within the range of applicability of the theory. The data indicate that when the nose parameters are varied over their entire range, no apparent effect in normal force is found until the Mach number exceeds 1.75. The neutral point location changes with each parametric variation regardless of the Mach number. Increasing the afterbody length gives an increase in normal force up to a Mach number of 1.75. Above Mach number 1.75, an increase in afterbody length does not change the normal force. The neutral point location shifts rearward and does not show any Mach number effect. The normal force and neutral point location variation with Mach number for each configuration exhibits the behavior generally shown by previous experiments with slender body shapes. (Author)

N65-23284 Field 16D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
INVESTIGATION OF AN UNDERSLUNG NORMAL-WEDGE INLET AT FREE-STREAM MACH NUMBERS FROM 1.50 TO 1.99,
by Donald J. Vargo and Maynard I. Weinstein.
19 Mar 57, 17p NACA-RM-E56F27

Unclassified report

Descriptors: (*Guided missile components, Aerodynamic characteristics).

N65-23336 Field 16D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EXPERIMENTAL AND ANALYTICAL INVESTIGATION OF THE TRANSONIC AND SUPERSONIC DIVERGENCE CHARACTERISTICS OF A DELTA-PLAN-FORM ALL-MOVABLE CONTROL,
by A. Gerald Rainey, Perry W. Hanson, and Dennis J. Martin. 4 Aug 58, 29p
NACA-RM-L58E07

Unclassified report

Descriptors: (*Guided missiles(Air-to-surface), Aerodynamic characteristics).

N65-23739 Field 16B, 22C
CFSTI Prices: HC$1.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
A TECHNIQUE FOR OPTIMUM FINAL VALUE CONTROL OF POWERED FLIGHT TRAJECTORIES (REVISION NO. 1),
by C. G. Pfeiffer. 1 May 1965, 20p
JPL-TR-32-477
Contract NAS7-100

Unclassified report

Descriptors: (*Rocket trajectories, Optimization), (*Ascent trajectories, Optimization).

N65-24057 Field 16D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
WIND-TUNNEL INVESTIGATION AT A MACH NUMBER OF 2.01 OF THE AERODYNAMIC CHARACTERISTICS IN COMBINED ANGLES OF ATTACK AND SIDESLIP OF SEVERAL HYPERSONIC MISSILE CONFIGURATIONS WITH VARIOUS CANARD CONTROLS,
by Ross B. Robinson. 10 Mar 1958, 35p
NACA-RM-L58A2

Unclassified report

Descriptors: (*Guided missiles, Aerodynamic characteristics).

Patent 3,200,402 Field 16D, 16A

SELF-CONTAINED DATA RECORDER.
Patent assigned to Navy,
by Dovie L. Coleman and Willy A. Fiedler.
10 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Guided missiles, Recording systems), (*Recording systems, Guided missiles), Transducers, Patents.

The recorder is self-contained and may be mounted to the exterior of a nonretrievable missile for separation and recovery after the launch phase. The recorder is enclosed in a watertight case and releasably secured to the missile exterior to permit recovery and re-use. Within the case are disposed a movable recording medium and a battery-operated motor for driving the recording medium. Various transducers are mounted in the recorder for transmitting the data to the recording medium.

Patent 3,200,749 Field 16C

PYROELECTRIC EFFECT IN A SUBMINIATURE HIGH VOLTAGE IMPACT FUSE.
Patent assigned to Navy,
by Rudolph N. Downs. 17 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Impact fuzes, Subminiature electronic equipment), (*Guided missile fuzes, Impact fuzes), Patents, Voltage, Detonators, Arming devices, Piezoelectric crystals, Thermoelectricity, Circuits.

The subminiature high voltage impact fuse is suitable for use on a ballistic missile whereby the thermal heating of the missile nose cone on atmosphere re-entry causes the fuse to be armed. Upon re-entry, the heat effects a crystalline material to generate a voltage which is applied to a detonator by a ceramic impact trigger.

Patent 3,200,750 Field 16D, 1A

INSULATING DEVICE.
Patent assigned to Army,
by Dale L. Burrows. 17 Aug 65 Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Ablation, Materials), (*Nose cones, Ablation), Thermal insulation, Aerodynamic heating, Guided missiles, Adhesives, Fibers(Synthetic), Reentry vehicles, Patents.

The insulating device is associated with the nose cone of a missile to render the cone resistant to the high temperatures encountered upon reentry to the atmosphere. A brush-like arrangement of fibers is disposed on a base which is attached by adhesive to the nose cone. The fibers may be made of the oxides of magnesium, silicon, thorium, and aluminum. The base material is made of ceramic material.

17. Navigation, Communications, Detection, and Countermeasures

AD-263 873 Field 17I, 22B, 22C
CFSTI Prices: HC$6.00

Ballastic Research Labs., Aberdeen Proving Ground, Md.
BRL-ARPA DOPLOC SATELLITE DETECTION COMPLEX.
Final technical summary rept. for 20 Jun 58-30 Jun 61,
by A. H. Hodge. Jul 61, 217p Rept. no. BRL-1136
Proj. DA503 06 011, ARPA Order 8 58
ARPA SFS-25
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.
Copy is available for public sale.

Descriptors: (*Satellites, Detection), (*Radar tracking, Satellites), (*Doppler radar, Phase-lock systems), Orbital trajectories, Doppler systems, Beams(Electromagnetic), Band-pass filters, Signal-to-noise ratio, Narrowband, Scanning.

The report consists of a technical summary of the research and development program sponsored under ARPA Order 8-58 which led to the proposal of a system for detecting and tracking non-radiating orbiting satellites. An interim research facility consisting of an illiminating transmitter and two receiving stations with fixed antenna arrays was first established to determine the feasibility of using the Doppler principle coupled with extremely narrow bandwidth phase-locked tracking filters as a sensor system. The interim system established the feasibility of using the Doppler method and resulted in real data for which computational methods were developed which produced orbital parameters from single pass data over a single station. To meet the expected space population problem of detection and identification and to obtain a maximum range with practical emitted power, a scanned fan beam system was proposed in which a transmitter and a receiver antenna separated by about 1,000 miles would be synchronously scanned about the earth chord joining the two stations to sweep a half cylinder of space volume 1000 miles long and having a radius of 3000 miles. (Author)

AD-427 120 Field 17I, 9A
CFSTI Prices: HC$3.00

Motorola, Inc., Scottsdale, Ariz. Military Electronics Div.
RESEARCH ON SURVEILLANCE RADAR RECEIVERS AND TRANSPONDERS.
Quarterly progress rept. no. 5, 1 May-31 Jul 63,
by R. C. Havens, G. Kennett, C. G. Hawkins, C. Sommers, and R. Eckstein. Aug 63, 87p
Rept. no. WP-2785-5
Contract DA36 039SC90700, Proj. 3A99 23 001
Unclassified report

Descriptors: (*Radar receivers, Search radar), (*Transponders, Search radar), Filters(Electromagnetic wave), Silicon, Reports, Symposia, X-band, C band, Modules(Electronics), Transistors, Microwave amplifiers, Parametric amplifiers, Tunnel diodes, Oscillators, Transistor amplifiers, Pumping-(Electronics), Noise(Radio), Capacitors, Radar equipment, Fourier analysis, Attenuation, Frequency, Bandwidth, Gain, Germanium, Stability, Temperature, Diodes(Semiconductor), Admittance, Circuits, Mixers(Electronics), Varactor diodes.

Preliminary results for an X-band subharmonically pumped parametric amplifier investigation are reported. Parametric oscillations in the 9 - 10 gc range were realized, but parametric gain has not been achieved to date. C-Band tunnel diode amplifier work carried out during the interval November 1962 through July 1963 is summarized. Voltage gain bandwidth products up to 2.5 gc and noise figures as low as 5.1 db were realized using a strip transmission line amplifier. Tunable narrow band operation was obtained with a new coaxial tunable amplifier. Stability analyses are presented and examples of their use are given. An X-band amplifier using capacitive susceptive tuning was unsuccessful. Preliminary data on a uhf transistor oscillator design and a single stage of varactor multiplication are presented. Evaluation results, for three integrated circuit Standard Amplifying Modules using 2N834 transistors, are reported. Gain and gain control characteristics agreed closely to predicted values; however, gain stability as a function of temperature was poor. Analytical design of the Standard Amplifying Module using the 2N918 transistor is reported upon, along with design evaluation tests and integrated form layout for the new CE-CE configuration. (Author)

N65-21460 Field 17B, 22B, 3A
CFSTI Prices: HC$2.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THE DESIGN OF THE RANGER TELEVISION SYSTEM TO OBTAIN HIGH-RESOLUTION PHOTOGRAPHS OF THE LUNAR SURFACE,
by Donald H. Kindt and Joseph R. Staniszewski.
1 Mar 65, 29p JPL-TR-32-717
Contract NAS7-100 Unclassified report
NASA CR-62189

Descriptors: (*Television communication systems, Lunar probes).

N65-23278 Field 17B
CFSTI Prices: HC$1.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
OPTIMAL COMMUNICATION NETS,
by R. J. McEliece. 15 Apr 1965, 12p
JPL-TR-32-697
Contract NAS7-100 Unclassified report
NASA CR-62612

Descriptors: (*Communication systems, Optimization), Communication theory.

N65-23282 Field 17B, 22B
CFSTI Prices: HC$3.00 MF$0.75

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SPACE PROGRAMS SUMMARY NO. 37-32., VOLUME III FOR THE PERIOD JANUARY 1, 1965 TO FEBRUARY 2, 1965. DEEP SPACE NETWORK,
by W. H. Pickering. 31 Mar 1965, 84p
JPL-SPS-37-32 Vol. 31
Contract NAS7-100
NASA CR-62609
Unclassified report

Descriptors: (*Space communication systems, Design).

N65-23285 Field 17H, 20E
CFSTI Prices: HC$2.00 MF$0.50

Electro-Optical Systems, Inc., Pasadena, Calif.
LASER BEACON STUDIES.
Final summary rept. 30 Jun-31 Oct 61,
by Paul C. Fletcher. 31 Oct 61, 49p EOS-1920F
Contract NAS8-2439NASA CR-62616
Unclassified report

Descriptors: (*Lasers, Beacons), (*Beacons, Lasers).

N65-28778 Field 17G, 22B
CFSTI Prices: HC$4.00 MF$1.00

American Bosch Arma Corp., Garden City, N. Y.
MANUAL SPACE NAVIGATION COMPUTER PROGRAM,
by W. Blair. Jul 65, 130p
Contract NAS2 1477
NASA CR-250
Unclassified report

Descriptors: (*Space navigation, Navigation computers), (*Programming(Computers), Navigation computers).

Patent 3,199,931 Field 17G

EXTERNALLY PRESSURIZED FLUID BEARING.
Patent assigned to NASA,
by Emmett L. Martz. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Bearings, Gyroscopes), Spacecraft, Patents, Pressure, Lubricants.

An arrangement is provided for supplying fluid to the floating member of an externally pressurized fluid bearing for gyros utilized in space flight vehicles. The structure includes an annual reservoir (or reservoirs) of constant pressure within the encircling members, and an annular restriction of constant width and constant length to restrict the fluid flow and thus create a pressure potential, and an enlarged annular slot of larger width than the restrictor and of constant length.

Patent 3,201,999 Field 17G

FLUID ACCELEROMETER.
Patent assigned to Army,
by Joe L. Byrd. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Accelerometers, Fluids), Patents, Cantilever beams, Deflection.

The fluid-operated device is for detecting acceleration and position of a missile or other types of vehicles. The device is operated solely by fluid and produces a fluid output proportional to acceleration. The deflection principle of a cantilever beam is utilized to effect a definite change in various fluid outputs of the device.

PB-168 425 Field 17I
CFSTI Prices: HC$3.00 MF$0.75

Inter-Range Instrumentation Group, White Sands Missile Range, N. Mex.
IRIG SYSTEM STANDARDS FOR C-BAND (5 CM) INSTRUMENTATION RADARS AND BEACONS.
Jul 61, 77p Document no. IRIG-106-59
Unclassified report

Descriptors: (*Radar, Guided missile ranges), (*Guided missile tracking systems, Standards), (*Radar tracking, Guided missile ranges), Radar signals, Ranges(Distance), Radar beacons, Transponders, Instrumentation, Test facilities, C band, Radar receivers, Radar transmitters, Instruction manuals.

These System Standards are presented in two major parts. Part I is for the radar-to-beacon link (the 'interrogation' link). Part II is for the beacon-to-radar link (the 'response' link). Each part is divided into topics, such as 'Frequency Range'. Under each topic, both the radar and the beacon are treated; with the transmitter being treated first and the receiver next.

PB-168 458 Field 17I
CFSTI Prices: HC$1.00 MF$0.50

Ballistic Research Labs., Aberdeen Proving Ground, Md.
LEAST SQUARE DETERMINATION OF POSITION FROM RADIO DOPPLER DATA,
by Boris Garfinkel. Sep 49, 17p Rept. no. BRL-707
Proj. TB3 0238D
ATI 192 564
Unclassified report

Descriptors: (*Guided missile tracking systems, Doppler systems), (*Position finding, Doppler systems), (*Least squares method, Position finding), (*Doppler systems, Guided missile tracking systems), Radio equipment, Range finding, Radio signals, Doppler effect.

When the number of radio-doppler receiving stations exceeds three the problem of calculating the position of a missile in space is overdetermined. A method of least squares is designed which overcomes the difficulty arising from the presence of a non-linear equation. The resulting solution is short, as well as accurate, and is identical in form with the one previously developed for the case of three stations. (Author)

18. Nuclear Science and Technology

AD-450 115 Field 18C, 15F, 13M
CFSTI Price: HC$3.00

URS Corp., Burlingame, Calif.
STRUCTURAL DEBRIS CAUSED BY NUCLEAR BLAST, Research rept.,
by J. E. Edmunds, C. K. Wiehle, and K. Kaplan.
Oct 64, 69p Rept. no. URS-639-4
Contract OCD PS64 19, Task 3312B Unclassified report

Descriptors: (*Fragmentation, Nuclear explosions), (*Nuclear explosion damage, Airburst), (*Structures, Nuclear explosion damage), Nuclear weapons, Radiation damage, Targets, Industrial plants, Blast, Strategic bombing, Mathematical prediction, Reviews, Civil defense systems, Buildings.

The purpose of this program was to develop means for predicting the quantity of structural debris produced by air blast from various types of nuclear weapon attack. In general it was not found possible to base quantitative estimates of debris on existing analyses of damage, since structural damage and the debris produced as a result of the damage are not necessarily related. Most of the applicable basic information was derived from tests (or attacks) with kilotron-range weapons, and therefore the first curves developed for estimating debris quantities--as functions of incident air blast overpressure level--were for kiloton-range weapons. However, analysis of the influence of the longer overpressure durations from megaton-range weapons on structural behavior permitted the development of curves predicting debris quantities for these weapons. The results to date of the program are summarized. These show debris quantities as a percentage of total building materials produced by various air blast overpressures from both kiloton- and megaton-range weapons for six classes of structures (light and heavy industrial, ordinary and aseismic design steel and reinforced concrete frame, wooden, and brick of masonry). (Author)

DP-929 Field 18I
CFSTI Prices: HC$4.00 MF$0.75

Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
PUBLICATIONS, 1951 THROUGH 1963,
comp. by H. S. Hilborn. Oct 64, 124p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Nuclear physics, Bibliographies).

DP-929 (sup 1) Field 18J, 7E
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Neumours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
PUBLICATIONS, 1964,
comp. by H. S. Hilborn. Feb 65, 19p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Nuclear physics, Bibliographies).

DPST-64-83-10 Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Du Pont De Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
USAEC - AECL COOPERATIVE PROGRAM.
Monthly progress rept. for Oct 64,
comp. by H. S. Hilborn. 19 Nov 64, 15p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Nuclear reactors, Operation).

GEAP-4777 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
AEC FUEL CYCLE PROGRAM ASSEMBLIES 2L AND 3L DESIGN AND FABRICATION OF FUEL RODS TO EVALUATE INCOLOY-800 CLADDING MATERIAL,
by J. P. Hoffmann, S. Y. Ogawa, and H. E. Williamson. 28 Dec 64, 38p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Reactor fuel cladding, Reactor fuel rods), (*Reactor fuel rods, Reactor fuel cladding).

GEAP-4821 Field 18J, 11F
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
SPECIFIC ZIRCONIUM ALLOY DESIGN PROGRAM.
Quarterly progress rept. no. 8,
by H. H. Klepfer, C. J. Baroch, R. E. Blood, J. L. Jaeck, and E. A. Pickett. Apr 65, 48p
EURAEC-1375
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Zirconium alloys, Reactor fuel cladding), (*Reactor fuel cladding, Zirconium alloys), (*Reactor fuel cladding, Zirconium alloys).

GEMP-43A Field 18J, 11F
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion-Operation.
HIGH-TEMPERATURE MATERIALS PROGRAM.
Progress rept. no. 43, pt. A.
29 Jan 65, 78p
Contract AT(40-1)-2847

Unclassified report

Descriptors: (*Heat resistant metals + alloys, Reactor materials), (*Reactor materials, Heat-resistant metals + alloys).

LA-3228 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
MODEL 200 AC/DC AIR SAMPLER,
by Morris J. Engelke. Feb 65, 20p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Radiation measurement systems, Atmosphere), Portable.

LA-DC-6753 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
IRRADIATION OF MOLTEN PU - CO - CE FUELS IN CONTACT WITH SODIUM,
by J. A. Basmajian. 12 Nov 64, 10p
CONF-641117-1
Contract W-7405-eng-36

Unclassified report

Presented at the High Temperature Fuels Committee Meeting (19th), Thousand Oaks, Calif. 16-18 Nov 64.

Descriptors: (*Reactor fuels, Radiation damage), (*Radiation damage, Plutonium alloys).

N65-22126 Field 18H
CFSTI Prices: HC$1.00 MF$0.50

Western Reserve Univ., Cleveland, Ohio.
BETA DECAY OF Rb86,
by Richard H. Thompson and Karl J. Casper.
1963, 18p
Grant NsG655
NASA CR-62339

Unclassified report

Descriptors: (*Rubidium, Beta decay), (*Beta decay, Rubidium).

NAA-SR-MEMO-9709 Field 18N
CFSTI Prices: HC$3.00 MF$0.75

Atomics International, Canoga Park, Calif.
FSM-1 PRE-STARTUP ORBITAL TEST RESULTS,
by T. J. Boyle and E. M. Ross. 23 Jul 64, 90p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Reactor start-up sources, Nuclear power plants), (*Nuclear power plants, Spacecraft).

NAA-SR-MEMO-10160 Field 18N, 9B
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
SCALP: SNAP 8 DRM1 CONVERSION PROGRAM,
by Katherine W. Wedeiros. 24 Aug 64, 25p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Spacecraft, Nuclear power plants), (*Nuclear power plants, Programming(Computers)), (*Programming(Computers), Nuclear power plants).

NAA-SR-MEMO-10181 Field 18N, 13K
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNAP 10A PB-SN-TE T/E PUMP S/N-030 ACCEPTANCE TEST,
by C. M. Quirk and T. M. Funakura. 8 Jul 64, 24p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Spacecraft, Nuclear power plants), (*Pumps, Nuclear power plants).

NAA-SR-MEMO-10399 Field 18N
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNAP 10A PB,SN,TE T/E PUMP S/N-032: ACCEPTANCE TEST,
by C. M. Quirk and T. M. Funakura. 2 Sep 64, 28p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Spacecraft, Nuclear power plants), (*Nuclear power plants, Pumps), (*Pumps, Nuclear power plants).

NAA-SR-MEMO-10401 Field 18N
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
ACCEPTANCE TEST OF PSM-3 DC CONDUCTION NA,K PUMP (MRP),
by W. H. Wickes. 2 Sep 64, 6p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Nuclear power plants, Pumps), (*Spacecraft, Nuclear power plants), (*Pumps, Liquid metals).

NAA-SR-MEMO-10464 Field 18N
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNAP 10A PB-SN-TE T/E PUMP S/N-033: ACCEPTANCE TEST,
by C. M. Quirk and T. M. Funakura. 24 Sep 64, 27p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Spacecraft, Nuclear power plants), (*Nuclear power plants, Pumps), (*Pumps, Nuclear power plants).

NAA-SR-MEMO-10633 Field 18I, 13H
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
CLOSURE WELD DEVELOPMENT REACTOR VESSEL, S8DS-12002,
by E. W. Crow. 30 Oct 64, 17p
Contract AT(11-1)-GEN-18

Unclassified report

Descriptors: (*Welds, Reactor system components), (*Reactor system components, Welding).

ORNL-3810 Field 18B, 20F
CFSTI Prices: HC$3.00 MF$0.50

Oak Ridge National Lab., Tenn.
ALPHA: A COMPUTER PROGRAM FOR THE DETERMINATION OF RADIOISOTOPES BY LEAST-SQUARES RESOLUTION OF THE GAMMA-RAY SPECTRA,
by E. Schonfeld. Jul 65, 44p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Radioactive isotopes, Gamma-ray spectra), (*Gamma-ray spectra, Least squares method).

ORNL-P-1065 Field 18J, 14B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SUMMARY OF EXPERIENCE WITH HIGH-TEMPERATURE THERMOCOUPLES USED IN THE ORNL-GCR PROGRAM FUEL IRRADIATION EXPERIMENTS,
by N. H. Briggs, E. L. Long, Jr., and F. R. McQuilkin. 1964, 22p CONF-650204-6
Contract W-7405-eng-26

Unclassified report

Presented at the Meeting on Thermocouple Technology and the Effects of Nuclear Radiation on Thermocouples, Washington, D. C.

Descriptors: (*Reactor fuel enrichment, Thermocouples), (*Thermocouples, Reactor fuel enrichment).

ORNL-TM-1032 Field 18I, 18D
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
LIGHT-ACTIVATED SWITCH BURNOUT DETECTION SYSTEM,
by W. R. Gambill. 11 Jan 65, 14p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Fuel burn up, Radiation measurement systems), (*Switching(Circuits), Photosensitivity).

ORNL-TM-1052 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
A SURVEY OF THE LITERATURE ON HYDRATED ACTINIDE OXIDE SOLS AND U(IV) AND U(VI) HYDROLYSIS REACTIONS,
by D. M. Helton. 5 Feb 65, 26p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Actinide series compounds, Reactor fuels), (*Hydrolysis, Uranium).

ORNL-TM-1113 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
INTERPRETATION OF PULSED SOURCE EXPERIMENTS,
by C. A. Preskitt and E. A. Nephew.
27 Apr 65, 25p CONF-650504-10
Contract W-7405-eng-26
Unclassified report

Presented at the IAEA Symposium on Pulsed Neutron Research, Karlsruhe, Germany, 10-14 May 65.

Descriptors: (*Neutron flux, Gas-cooled reactors), (*Critical assemblies, Gas-cooled reactors).

ORNL-TM-1127 Field 18F, 18L
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
DESCRIPTION OF FACILITY RADIATION AND CONTAMINATION SYSTEMS INSTALLED IN THE MOLTEN-SALT REACTOR EXPERIMENT BLDG. 7503,
by J. A. Russell, Jr., and D. J. Knowles.
13 May 65, 15p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Power reactors, Contamination), (*Reactor safety systems, Contamination).

ORNL-TM-1133 Field 18J
CFSTI Prices: HC$8.12 MF$2.25

Oak Ridge National Lab., Tenn.
NUCLEAR FUEL CYCLE RESEARCH IN RUSSIA: A LITERATURE SURVEY,
by A. T. Gresky. 13 May 65, 512p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Fuel burn up, USSR).

Patent 3,200,046 Field 18I, 18J

NEUTRONIC REACTOR STRUCTURE.
Patent assigned to AEC,
by John T. Carleton. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Reactor moderators, Graphite), Patents.

The neutronic reactor structure includes sets of horizontal layers of graphite blocks, alternating sets being nonperforated and perforated. The sets are arranged in a specific configuration. The perforated blocks house fissionable material.

Patent 3,202,585 Field 18J

HIGH TEMPERATURE NIOBIUM-UO2 NUCLEAR FUEL SHEET.
Patent assigned to AEC,
by Harry P. Kling, Lawrence Sama, Seymour Priceman, Bernard Brodwin, and Abraham Eiss. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Reactor fuel elements, Sheets), (*Composite materials, Reactor fuel elements), Niobium, Uranium compounds, Dioxides, Cladding, Niobium alloys, Titanium alloys, Aluminum alloys, Molybdenum alloys, Metal coatings, Powder metallurgy, Reactor fuel cladding, Reactor fuel plates, Rolling(Metallurgy), Silicon alloys.

The nuclear fuel element is in the form of a ribbon. A core of enriched uranium is prepared in a matrix made of niobium. The core is clad with an alloy consisting of niobium-titanium-aluminum alloys and niobium-titanium alloys and is dipped in a molten metal bath of aluminum 11 w/o silicon.

PB-168 344 Field 18H, 4A
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
STUDY OF RADIO-ACTIVE IONS IN THE ATMOSPHERE (Etude des Ions Radioactifs de l'Atmosphere).
Doctoral thesis,
by Andre Renoux. 1965, 88p Rept. no. CEA-R-2771
Unclassified report

Text in French with attached summary in English.

Descriptors: (*Ions, Radioactivity), (*Atmosphere, Ions), (*Radon, Radioactive isotopes), Alpha counters, Air, Gamma-ray spectroscopy, Artificial radioactivity.

A comparative study is made of active deposits of radon and thoron in suspension in the atmosphere by means of alpha radiation counting, using ZELENY tubes, scattering equipment, filter papers or membranes. It has been possible to show the existence of small and large ions which are negative and positive, as well as of neutral radioactive nuclei; their properties are studied. A theoretical interpretation of the results is presented. The average content of radon (using the Ra A concentration) and of Th B in the air has been determined. The radioactive equilibrium between radon and its daughter products in atmospheric air are examined. The techniques developed for active radon and thoron deposits are applied to the study of artificial radioactivity, the analyses being carried out by means of gamma spectrometry. (Author)

PB-168 348 Field 18D, 20H
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Cadarache (France). Centre d'Etudes Nucleaires.
THE MULTI-SPHERE TECHNIQUE. I. GENERAL CHARACTERISTICS AND APPLICATIONS (La Technique Multisphere. I. Caracteristiques Generales et Applications),
by Henryk Zaborowski. Jul 65, 55p
Rept. no. CEA-R-2772
Unclassified report

Text in French with attached summary in English.

Descriptors: (*Neutron flux, Measurement), Dosimeters, Neutron spectrum, Neutron detectors, Thermal neutrons, Fast neutrons, France.

A study is made of the general characteristics and the applications of the multisphere technique for flux measurements, dosimetry and the spectrometry of neutron sources ranging from thermal up to 7 MeV neutrons. The equations are given relating to three fluxmeters (proportional long counters) for the measurements of the flux. Equations have been derived for multicollision rad and rem dosimetry and first collision rad dosimetry, and for the spectrometry and dosimetry of neutrons in five energy bands using a method similar to that used by threshold detectors. (Author)

PB-168 351 Field 18I, 18K
CFSTI Prices: HC$3.00 MF$0.50

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
RESULTS AND INTERPRETATION OF SPECTRAL INDICES MEASUREMENTS MADE WITH AQUILON (Resultats et Interpretation de Mesures d'Indices de Spectre dans Aquilon),
by Jean-Pierre Frichet, Jean Mougey, Roger Naudet, and Jean Taste. Aug 65, 56p Rept. no. CEA-R-2482
Unclassified report

Text in French with attached summary in English.

Descriptors: (*Reactor lattice parameters, Heavy water reactors), (*Heavy water reactors, Reactor lattice parameters), Reactor theory, Reactor fuel elements, Uranium, Uranium alloys, Plutonium alloys, France.

This report deals with a set of spectral indices measurements made in the heavy water reactor Aquilon on lattices constituted by massive fuel elements of dia. 29.2 mm. The fuel elements were made either of natural uranium or of slightly depleted or slightly enriched uranium, or of an uranium-plutonium alloy. The measurements were carried out for various lattice pitches (square pitch from 110 to 210 mm) and in certain cases for various temperatures (from 20 to 80C). The results are compared to calculated values obtained by using the latest advances of the thermalization theory developed at Saclay applied to the moderation by heavy water. (Author)

SCNC-314 Field 18J, 11C, 11F
CFSTI Prices: HC$2.00 MF$0.75

Sylvania-Corning Nuclear Corp., Bayside, N. Y.
OXIDATION TESTING OF COATED NIOBIUM ALLOY FUEL ELEMENTS,
by S. Priceman and L. Sama. Sep 60, 33p
Contract AT(30-1)-GEN-366
Unclassified report

Descriptors: (*Reactor fuel elements, Niobium alloys), (*Niobium alloys, Oxidation), Coatings.

SCNC-316 Field 18J, 11F
CFSTI Prices: HC$3.00 MF$0.75

Sylvania-Corning Nuclear Corp., Bayside, N. Y.
PREPARATION AND PROPERTIES OF CbAl3 AND CbAl3 FUEL BODIES,
by M. F. Judkins, and L. Sama. Sep 60, 51p
Contract AT(30-1)-GEN-366
Unclassified report

Descriptors: (*Reactor fuel processing, Niobium alloys), (*Niobium alloys, Aluminum alloys), Intermetallic compounds.

SwRI-1228-42 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Southwest Research Inst., San Antonio, Tex.
EVALUATION OF THE SERVICEABILITY OF THE ELK RIVER REACTOR PRESSURE VESSEL.
Progress rept., no. 8, 1 Aug-30 Sep 64,
by Jose McDonald, Jr., and Paul D. Watson.
2 Nov 64, 13p
Contract AT(11-1)-1228
Unclassified report

Descriptors: (*Reactor system components, Pressure vessels), (*Pressure vessels, Failure (Mechanics)).

SwRI-1228-51 Field 18J, 13H
CFSTI Prices: HC$2.00 MF$0.50

Southwest Research Inst., San Antonio, Tex.
STUDIES OF THE FATIGUE STRENGTH OF PRESSURE VESSELS. 1. CYCLIC PRESSURE TESTS OF LARGE SIZE PRESSURE VESSELS. 2. LOW CYCLE FATIGUE TESTING OF ONE-HALF SCALE MODEL PRESSURE VESSELS. 3. EFFECT OF WELD DEFECTS ON THE FATIGUE STRENGTH OF A302B STEEL.
Progress rept. no. 12,
by A. G. Pickett, S. C. Grigory, and A. R. Whiting.
18 Jan 65, 41p SwRI-1228-52, SwRI-1228-53
Contract AT(11-1)-1228
Unclassified report

Descriptors: (*Pressure vessels, Fatigue(Mechanics)), (*Fatigue(Mechanics), Pressure vessels), Life expectancy, Strength, Welds.

SwRI-1228-54 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Southwest Research Inst., San Antonio, Tex.
EVALUATION OF THE SERVICEABILITY OF THE ELK RIVER REACTOR PRESSURE VESSEL.
Progress rept. no. 9, 1 Oct-30 Nov 64,
by Jose McDonald, Jr. and Paul D. Watson.
29 Jan 65, 8p
Contract AT(11-1)-1228
Unclassified report

Descriptors: (*Reactor system components, Pressure vessels), (*Pressure vessels, Radiation damage).

SwRI-1228-56 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Southwest Research Inst., San Antonio, Tex.
EVALUATION OF THE SERVICEABILITY OF THE ELK RIVER REACTOR PRESSURE VESSEL.
Progress rept. no. 10, 1 Dec 64-28 Feb 65,

by C. E. Lautzenheiser, Jose McDonald, Jr., and Allen R. Whitting. 15 Mar 65, 22p
Contract AT(11-1)-1228

Unclassified report

Descriptors: (*Reactor system components, Pressure vessels), (*Pressure vessels, Failure-(Mechanics)).

TID-21400 Field 18D, 18F
CFSTI Prices: HC$1.00 MF$0.50

Oregon State Univ., Corvallis.
A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS,
by John R. Prince and Chih H. Wang. 1964, 17p
Contract AT(45-1)-1387

Unclassified report

Descriptors: (*Scintillation counters, Beta decay), (*Radiological contamination, Evaluation).

TID-21644 Field 18D, 18J
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
GANTRY AND TROLLEY FOR FUEL HANDLING CASK,
by J. Dearriets. 17 Jul 59, 18p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Reactor fuels, Handling), (*Hoists, Reactor fuels).

TID-21668 Field 18J, 20M
CFSTI Prices: HC$1.00 MF$0.50

General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
THERMAL CONDUCTIVITY OF UO 2 BY A RADIAL HEAT FLOW METHOD,
by A. D. Feith. 1963, 25p TM-63-9-5
Contract AT(40-1)-2847

Unclassified report

Descriptors: (*Thermal conductivity, Reactor fuels), (*Reactor fuels, Uranium compounds).

WAPD-T-1721 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh.
THE REPRESENTATION OF FEW-GROUP CROSS SECTIONS IN MULTIREGION DIFFUSION-DEPLETION CALCULATIONS,
by R. J. Breen. Jan 65, 15p CONF-654-52
Contract AT(11-1)-GEN-14

Unclassified report

Presented at the American Nuclear Society Meeting, San Francisco, Calif., Dec 1964.

Descriptors: (*Reactor kinetics, Critical assemblies), (*Fuel burn up, Reactor kinetics).

WAPD-TM-478 Field 18K, 9B
CFSTI Prices: HC$4.00 MF$1.00

Bettis Atomic Power Lab., Pittsburgh.
HARMONY SYSTEM FOR NUCLEAR REACTOR DEPLETION COMPUTATION,
by R. J. Breen, O. J. Marlowe, and C. J. Pfeifer.
Jan 65, 108p
Contract AT(11-1)-GEN-14

Unclassified report

Descriptors: (*Fuel burn up, Programming(Computers)), (*Reactor kinetics, Fuel burn up).

WAPD-TM-481 Field 18F, 9B
CFSTI Prices: HC$3.00 MF$0.75

Bettis Atomic Power Lab., Pittsburgh, Pa.
SNUG: A MONTE CARLO SHIELD DESIGN PROGRAM FOR THE PHILCO-2000 COMPUTER,
by N. D. Cook. Nov 64, 63p
Contract AT-11-1-GEN-14

Unclassified report

Descriptors: (*Reactor shielding calculations, Programming(Computers)), (*Programming(Computers), Monte Carlo method).

WAPD-TM-482 Field 18K, 9B
CFSTI Prices: HC$1.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
TXYO1: A ONE-GROUP TRANSPORT PROGRAM FOR X-Y GEOMETRY,
by J. H. Bennett. Oct 64, 17p
Contract AT-11-1-GEN-14

Unclassified report

Descriptors: (*Neutron transport theory, Programming-(Computers)), (*Programming(Computers), Neutron transport theory).

WASH-1054 Field 18D
CFSTI Prices: HC$5.00 MF$1.25

Division of Reactor development (AEC), Washington, D. C.
PROCEEDINGS OF THE MEETING ON FAST REACTOR CONTROL MECHANISMS HELD AT ATOMIC ENERGY COMMISSION HEADQUARTERS BUILDING, GERMANTOWN, MARYLAND, SEPTEMBER 16 AND 17, 1964,
ed. by C. J. Heltemes, Jr. 1964, 200p CONF-756

Unclassified report

Descriptors: (*Reactor control, Fast reactors), (*Fast reactors, Reactor control).

19. Ordnance

AD-288 136 Field 19E, 1C
CFSTI Price: HC$2.00

Springfield Armory, Mass.
HELICOPTER ACCURACY STUDY.
Technical rept.,
by A. H. Lariviere, J. R. Mayer, and J. F. O'Neil.
8 Aug 62, 39p Rept. no. SA-TR-20-9209
Proj. DA 502 05 010

Unclassified report

Descriptors: (*Helicopters, Aircraft fire control systems), (*Aircraft fire control systems, Helicopters), Flight testing, Optical tracking, Target recognition, Automatic weapons, Small arms, Armament, Effectiveness.

A study was made to determine the accuracy of the MX153 (Quad) armament subsystem. Target acquisition and tracking capabilities of this subsystem were compared with those (results) presented in the referenced report. Basic accuracy of the 7.62mm M73 machine gun fired from the HU-1A helicopter equipped with the SM153 armament subsystem was determined. Also, basic accuracy of the 7.62mm M60 machine gun fired from the H-13H helicopter equipped with the XM2 armament subsystem was determined. Recommendations were made for improvement of the MX153 armament subsystem, and for future study and evaluation of the helicopter armament program. Test procedure is described and results discussed. (Author)

AD-451 948 Field 19G, 19E, 19D
CFSTI Prices: HC$2.00

Army Electronics Research and Development Activity, White Sands Missile Range, N. Mex.
ROCKET IMPACT PREDICTION EQUIPMENT AT WHITE SANDS MISSILE RANGE.
Technical rept.,
by Roy I. Glass, Jr. Nov 64, 26p
Rept. no. ERDA-211
Task 1V650212D127 02

Unclassified report

Descriptors: (*Terminal ballistics, Rocket trajectories), (*Impact prediction, Rockets), (*Ground support equipment, Rocket launchers), Ranges(Establishments), New Mexico, Guided missile ranges, Wind, Analog computers, Digital systems, Launching, Ballistics, Meteorological instruments, Theodolites, Tracking, Display systems, Meteorological ballons, Radiosondes.

An impact prediction system for unguided rockets has been developed at White Sands Missile Range. The impact predictions are made relative to the wind effects on the ballistic trajectory. An analog computer is described which calculates the impact variations, and a digital system is presented which calculates launcher angles for the rocket. (Author)

Patent 3,198,074 Field 19F

PIEZOELECTRIC-POWERED GUN FIRING MECHANISM.
Patent assigned to Army,
by William E. Perkins. 3 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Firing mechanisms(Weapon), Gun components), (*Piezoelectric transducers, Firing mechanisms(Weapon)), Gun barrels, Patents.

The firing or bolt mechanism is for use in a rotary multi-barreled or Gatling type gun. The piezoelectric power source is mounted in the bolt for each barrel being fired. Each bolt is also provided with a stress applicator. The gun is for firing ammunition having sensitive electrical primers.

Patent 3,199,415 Field 19F

PNEUMATIC MOTOR.
Patent assigned to Navy,
by Arthur J. Stanton, David F. Anderson and George B. Boniface. 10 Aug 65 Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Pneumatic devices, Ejectors(Ordnance)), (*Ejectors(Ordnance), Pneumatic devices), Antiaircraft ammunition, Naval guns, Patents.

The gas operated piston arrangement is for a rapid fire weapon system for shipboard antiaircraft use. The system includes fluid by-pass features to permit buffering of the piston at the end portion of its driving stroke and for returning the piston to its initial position. Venting passages are provided for venting the piston driving gases.

Patent 3,199,453 Field 19A

SUBMARINE SIGNAL FUZE.
Patent assigned to Navy,
by Stanley M. Fasig and Glenn C. Johnson. 10 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Signals, Submarines), (*Float flares, Actuators), (*Actuators, Float flares), Patents, Pyrotechnics, Submarines, Valves, Springs, Sea water, Water-activated batteries), Explosives initiators, Underwater-to-surface.

The signaling device contains a pyrotechnic composition. It is designed for launching from a submarine. The device can be launched from various depths but does not ignite until it reaches the surface of the water. The fuse is actuated when a compartment is flooded and the sea water energizes a battery.

Patent 3,200,315 Field 19H

ELECTRIC MOTOR SYSTEM.
Patent assigned to Navy,
by Harold W. Thompson. 10 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Electric motors, Direct current), (*Recording systems, Torpedoes), (*Torpedoes, Electric motors), Acoustic torpedoes, Homing torpedoes, Circuits, Patents.

The D.C.-energized brushless-motor system is useful in driving film-type recorders, as used in the exercise sections of acoustic-homing torpedoes during underwater test runs. The motor has a permanently-magnetized rotor, a specially wound stator, and a pair of power-type transistors which in an oscillatory circuit including the stator windings and powered from a D.C.-source, serve to run the motor at a synchronous speed corresponding to the operating frequency of the oscillatory circuit and the number of pairs of rotor or stator poles.

Patent 3,200,709 Field 19F

FIRING MECHANISM WITH INTEGRAL SAFETY.
Patent assigned to Army,
by Alfred L. Montana. 17 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Firing mechanisms(Weapon), Safety devices), Small arms, Dual purpose guns, Gun components, Automatic weapons, Patents.

The firing mechanism is for a fire arm. The fire arm may be selectively fired automatically in open bolt position or semiautomatically in closed bolt position with the automatic sear acting as a safety to assure that the hammer cannot be released if the trigger is repulled before the bolt reaches battery when the firearm is fired semiautomatically.

Patent 3,201,707 Field 19H

DEVICE FOR PRODUCING A SIGNAL FOR ACTUATION OF ACOUSTIC MINES.
Patent assigned to Navy,
by Marcel J. Aucremanne and Daniel D. Woolston.
17 Aug 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Acoustic mines, Explosive actuators), (*Explosive actuators, Acoustic mines), Counter measures, Relaxation oscillators, Underwater sound signals, Underwater mines, Patents, Pulse generators, Amplifiers, Transducers.

The device is for producing a signal for the actuation of acoustic mines. The system includes a multivibrator, a clipping circuit connected to clip the output of the multivibrator, a peaking circuit connected to the clipping circuit, a ringing circuit and a motor driven potentiometer.

Patent 3,201,791 Field 19E, 17I

NEAR MISS DISTANCE SCORING SYSTEM USING DOPPLER EFFECT.
Patent assigned to Air Force,
by Homer F. Roland. 17 Aug 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Firing-error indicators, Doppler systems), (*Doppler systems, Firing-error indicators), Aerial gunnery, Aerial targets, Kill probabilities, Doppler radar, Fire control system components, Patents.

The system indicates the minimum distance between a target and a projectile fired at the target. The number of Doppler-shifted echo signals returning to a target after reflection from an approaching intercept object is translated conveniently into miss distance figures. The radar system is disposed aboard the target. The intercept object may be a rocket, missile, or the like.

Patent 3,201,887 Field 19F

FOLDING STOCK FOR SHOULDER ARMS.
Patent assigned to Army,
by Herve L. Sedelow. 24 Aug 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.50

Descriptors: (*Small arms, Gun components), (*Gun components, Small arms), Flexible structures, Patents.

The stock is for shoulder arms. The butt section may be folded up to lay along the receiver and thereby reduce the length of the weapon while it is being carried. The rifle stock has a conventional forward section made of wood or plastic. The butt section is hinged and is made of spring steel bar stock bent to a configuration approximating the outline of a conventional butt piece.

PB-168 148 Field 19F
CFSTI Prices: HC$2.00 MF$0.50

Springfield Armory, Mass. Research and Development Div.
A SUMMARY OF THE DEVELOPMENT OF THE GUN, AUTOMATIC, 30mm, T154 (LIQUID PROPELLANT AMMUNITION),
by E. A. Humphrey and H. J. Ouellette. 1 Oct 58, 43p
Technical rept. no. SA-TR7-3000
Projs. TS3 3050, DA502 08 036
AD 221 556

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Guns, Liquid gun propellants), Automatic weapons, Firing tests, Feasibility studies, Feed mechanisms, Interior ballistics, Design, Feed pumps, Operation, Gases.

Many design sketches of liquid propellant guns were made up and evaluated. A three-barrel, gas-operated, electrically fired, Gatling type gun with a projectile carrier feed system was selected as the most satisfactory of the proposed designs. Firing tests of carriers were proposed to gather data. Text fixtures were designed to determine the physical characteristics of a projectile carrier assembly subjected to simulated firing pressures. Limited firing tests were performed to determine the ballistic properties of liquid propellant ammunition. Pumping and metering studies were performed and test fixtures were designed and built. Liquid propellant systems utilizing pressurized accumulators gas-operated pumps, and a displacement piston pump were proposed for pumping and metering. Indications were that the three-gas-operated pump system would be more satisfactory than the other proposed systems. It was determined that liquid propellant supply lines and valves should be as large as possible in order to fill the chamber in the allowed time without excessive pump pressures. Results of the study indicate that the liquid propellant gun is feasible. (Author)

PB-168 462 Field 19E
CFSTI Prices: HC$1.00 MF$0.50

Ballistic Research Labs., Aberdeen Proving Ground, Md.
BOUNDS ON ERRORS IN K SUB D CAUSED BY RANDOM ERRORS OF MEASUREMENT IN A FIVE STATION RANGE,
by F. D. Bennett and J. M. Bartos. Apr 54, 15p
Memo. rept. no. 780
Projs. DA 503 03 001; TB3 0108J Unclassified report
AD 34 747

Descriptors: (*Firing-errors indicators, Range tables), Errors, Least squares method, Drag.

The maximum effect of random errors in a five station firing range is investigated. Because the data reduction method for drag coefficient, K sub D, requires fitting the time-distance data with a cubic polynomial by the method of least squares, the problem becomes that of investigating the maximum effect of random errors in the data on the coefficients of the cubic. This is done in a general way that will apply to a polynomial of any degree and a range of any odd number of stations. Curvature changes associated with particular distributions of errors are found to cause the largest errors in the least squares coefficients and hence in the drag values. (Author)

PNE-600F Field 19D
CFSTI Prices: HC$4.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
TECHNICAL DIRECTORS SUMMARY REPORT,
by M. D. Nordyke, R. W. Terhune and R. F. Rohrer.
Dec 64, 111p
Contract W-7405-eng-48
Unclassified report

Rept. on Project Dugout and Plowshare Program.

Descriptors: (*Underground explosions, Reviews).

SCR-722 Field 19A
CFSTI Prices: HC$1.00 MF$0.50

Aerojet-General Corp., Downey, Calif.
LOW DETONATION PRESSURE EXPLOSIVES,
by M. T. Abegg, H. J. Fisher, H. C. Lawton, and W. T. Weatherill. Dec 64, 22p CONF-117-46
Contract AT(29-1)-789
Unclassified report

Presented at the American Chemical Society National Meeting (145th), New York, Sep 63.

Descriptors: (*Explosive materials, Sensitivity).

20. Physics

N65-18442 Field 20I, 14B
CFSTI Prices: HC$1.00 MF$0.50

Mithras, Inc., Cambridge, Mass.
A SHOCK TUBE TECHNIQUE FOR INVESTIGATING DROPLET ELECTRIFICATION IN IONIZED FLOWS.
Sep 64, 10p MP-64-138
Contract NASW941
NASA CR-57139
Unclassified report

Descriptors: (*Drops, Electrostatics), (*Plasma sheath, Drops).

N65-18445 Field 20M
CFSTI Prices: HC$1.00 MF$0.50

Southern Methodist Univ., Dallas, Tex.
HEAT TRANSFER ACROSS SURFACES IN CONTACT-TRANSIENT EFFECTS OF AMBIENT TEMPERATURES AND PRESSURES,
by H. A. Blum and C. J. Moore, Jr. 1964, 11p
Contract NSG711
NASA CR-57137
Unclassified report

Descriptors: (*Heat transfer, Surfaces), (*Joints, Heat transfer).

N65-18943 Field 20E, 17B, 9A
CFSTI Prices: HC$2.00 MF$0.50

Hallicrafters Co., Chicago, Ill.
STUDY OF COMMUNICATIONS SYSTEMS, AND DETECTION AND TRACKING SYSTEMS. DESIGN AND FABRICATION OF DYNAMIC CROSSED-FIELD ELECTRON-MULTIPLYING LIGHT DEMODULATORS.
Periodic progress rept. no. 2, 20 Jun-20 Sep 64. 1964, 41p
Contract NAS5 3777
NASA CR-57187
Unclassified report

Descriptors: (*Demodulators, Light), (*Electron multipliers, Crossed field devices), (*Lasers, Light communication systems).

N65-19716 Field 20H, 3B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
INVERSE COMPTON SCATTERING OF COSMIC RAY ELECTRONS,
by Frank C. Jones. Oct 64, 33p
NASA-TM-X-55138, X-641-64-28
Unclassified report

Descriptors: (*Electrons, Compton scattering), (*Compton scattering, Electrons), Photons, Cosmic rays.

N65-19717 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
KELVIN-HELMHOLTZ INSTABILITY IN AN ANISOTROPIC PLASMA,
by S. P. Talwar. Oct 64, 14p
NASA-TM-X-55143, X-64164-305
Unclassified report

Descriptors: (*Plasma physics, Stability), Magnetohydrodynamics.

N65-20107 Field 20I, 20D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
THE CONSTRICTED-ARC SUPERSONIC JET,
by Charles E. Shepard. 1963, 17p
NASA-TM-X-56181
Unclassified report

Presented at the Semiannual Meeting of the Supersonic Tunnel Association (19th), Ottawa (Canada), 16-17 May 63.

Descriptors: (*Plasma jets, Supersonic nozzles), (*Electric arcs, Plasma jets).

N65-20115 Field 20K
CFSTI Prices: HC$4.00 MF$0.75

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
FATIGUE: A COMPLEX SUBJECT - SOME SIMPLE APPROXIMATIONS,
by S. S. Manson. 1964, 107p NASA-TM-X-52084
Unclassified report

Presented to the Society for Experimental Stress Analysis, Cleveland, Ohio, 30 Oct 1964.

Descriptors: (*Fatigue(Mechanics), Analysis).

N65-20623 Field 20J, 7D
CFSTI Prices: HC$1.00 MF$0.50

Wisconsin Univ., Madison. Theoretical Chemistry Inst.

DIPOLE MATRIX ELEMENTS IN HELIUM IN THE FIRST ORDER SHIELDING APPROXIMATION,
by Kenneth M. Sando and Saul T. Epstein.
3 Mar 65, 18p WIS-TC1-82
Grant NsG-275-62
NASA CR-57587

Unclassified report

Descriptors: (*Electron transitions, Helium), (*Helium, Quantum mechanics).

N65-20624 Field 20J
CFSTI Prices: HC$2.00 MF$0.50

Wisconsin Univ., Madison. Theoretical Chemistry Inst.
PHASE SHIFTS AND THE QUANTUM MECHANICAL HAMILTON-JACOBI EQUATION,
by Donald J. Kouri and C. F. Curtiss. 1 Mar 65, 37p
WIS-TCI-81
Grant NsG-275-62
NASA CR-57579

Unclassified report

Descriptors: (*Phase shift, Quantum mechanics), (*Quantum mechanics, Phase shift).

N65-20812 Field 20M, 1A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
RADIANT HEAT TRANSFER TO ABSORBING GASES WITH FLOW AND CONDUCTION,
by T. H. Einstein. 1962, 8p NASA-TM-X-56222

Unclassified report

Prepared for presentation to the ARB/ANS/IAS Nuclear Propulsion Conference at Monterey, Calif., on 15-17 Aug 62.

Descriptors: (*Heat transfer, Gases).

N65-23277 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Jet propulsion Lab., Calif. Inst. of Tech., Pasadena,
DIPOLAR COORDINATES,
by Russell E. Carr. 1 Apr 65, 22p JPL-TR-32-696
Contract NAS7-100
NASA CR-62613

Unclassified report

Descriptors: (*Dipole moments, Magneto-hydrodynamics), Vector analysis.

N65-23286 Field 20M
CFSTI Prices: HC$4.00 MF$1.00

Jet Propulsion Lab., Calif Inst. of Tech., Pasadena.
TURBULENT BOUNDARY-LAYER HEAT TRANSFER FROM RAPIDLY ACCELERATING FLOW OF ROCKET COMBUSTION GASES AND OF HEATED AIR,
by D. R. Bartz. Dec 63, 128p
Contracts NASw-6; NAS7-100; DA-04-495-ORD-18
NASA CR-62615

Unclassified report

Descriptors: (*Turbulent boundary layer, Heat transfer), (*Exhaust gases, Rockets).

N65-23671 Field 20M
CFSTI Prices: HC$3.00 MF$0.50

Pratt and Whitney Aircraft, East Hartford, Conn.
COMPUTER PROGRAM FOR LIQUID METAL CONDENSING HEAT TRANSFER COEFFICIENTS INSIDE TUBES,
Manual,
by Harold L. Ornstein. Mar 1965, 54p PWA-2556
Contract NAS3-2335
NASA CR-54350

Unclassified report

Descriptors: (*Liquid metals, Condensation), (*Heat transfer coefficients, Programming(Computers)).

N65-23698 Field 20D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
JET PENETRATION INTO A LIQUID,
by H. G. Struck. 8 Mar 65, 41p NASA-TM-X-53214

Unclassified report

Descriptors: (*Jets, Penetration), (*Liquids, Penetration).

N65-23740 Field 20H, 12A
CFSTI Prices: HC$2.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
A NEW APPROACH TO THE HOMOGENIZATION OF HETEROGENEOUS MEDIA FOR NEUTRON DIFFUSION CALCULATIONS,
by Alan M. Jacobs. 15 Apr 65, 28p JPL-TR-32-686
Contract NAS7-100
NASA CR-62712

Unclassified report

Descriptors: (*Neutron transport theory, Numerical methods and procedures), (*Numerical methods and procedures, Neutron scattering).

N65-24013 Field 20M
CFSTI Prices: HC$3.00 MF$0.75

Pratt and Whitney Aircraft, East Hartford, Conn.
ANALYTICAL STUDY OF LIQUID METAL CONDENSING INSIDE TUBES,
by H. R. Kunz. Jan 65, 88p PWA-2530
Contract NAS3-2335
NASA CR-54352

Unclassified report

Descriptors: (*Liquid metals, Condensation).

N65-24387 Field 20M, 11F, 14B
CFSTI Prices: HC$3.00 MF$0.75

Battelle Memorial Inst., Columbus, Ohio.
DEVELOPMENT OF A VAPOR PRESSURE-OPERATED HIGH-TEMPERATURE SENSOR DEVICE. Final rept.,
by J. R. Van Orsdel, G. E. Raines, and J. M. Allen.
11 Mar 65, 70p
Contract NAS3-5202
NASA CR-54369

Unclassified report

Descriptors: (*Temperature sensitive elements, Metals).

N65-25597 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EXTENSION OF AN ANALYSIS OF PERIPHERAL WALL CONDUCTION EFFECTS FOR LAMINAR FORCED CONVECTION IN THIN-WALLED RECTANGULAR CHANNELS,
by Joseph M. Savino and Robert Siegel. Jun 65, 32p NASA-TN-D-2860
Unclassified report

Descriptors: (*Thermal conductivity, Laminar flow), (*Convection, Thermal conductivity).

N65-26049 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EVALUATION OF TWO DIRECT-CURRENT METHODS OF PLASMA PRODUCTION FOR USE IN MAGNETIC MIRROR EXPERIMENTS,
by Roman Krawes, George M. Prok, and Clyde C. Swett. Jun 65, 26p NASA-TN-D-2862
Unclassified report

Descriptors: (*Gas ionization, Electric discharges), (*Plasma physics, Gas ionization).

N65-26411 Field 20L, 18H, 20H
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EFFECT OF 40-MEV PROTONS ON SEMICONDUCTORS AS DETERMINED WITH AN IMPROVED METHOD OF MEASURING DIFFUSION LENGTH OF MINORITY CARRIERS,
by Marvin E. Beatty and Gerald F. Hill. Jun 65, 19p NASA-TN-D-2817
Unclassified report

Descriptors: (*Semiconductors, Radiation damage), (*Radiation damage, Semiconductors).

N65-26640 Field 20F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
MECHANISM OF FORMATION OF CERTAIN METASTABLE PEAKS NOTED ON A CYCLOIDAL FOCUSING MASS SPECTROMETER,
by Myron O. Davies. Jun 65, 7p NASA-TM-X-1111
Unclassified report

Descriptors: (*Mass spectroscopy, Spectrum analyzers), (*Spectrum analyzers, Mass spectroscopy).

N65-26642 Field 20K
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
FREE AND FORCED VIBRATIONS OF CANTILEVER BEAMS WITH VISCOUS DAMPING.
Jun 65, 44p NASA-TN-D-2831
Unclassified report

Descriptors: (*Cantilever beams, Vibration), Damping.

N65-26648 Field 20D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
EFFECT OF HIGH-VELOCITY FLUID FLOW ON THE BENDING VIBRATIONS AND STATIC DIVERGENCE OF A SIMPLY SUPPORTED PIPE,
by Harold L. Dodds, Jr. and Harry L. Runyan. Jun 65, 10p NASA-TN-D-2870
Unclassified report

Descriptors: (*Pipes, Fluid flow), (*Fluid dynamic properties, Pipes).

N65-27272 Field 20H, 20J
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
COMPARISON OF GRYZINSKI'S AND BORN'S APPROXIMATIONS FOR INELASTIC SCATTERING IN ATOMIC HYDROGEN,
by Carl F. Monnin and George M. Prok. Jun 65, 21p NASA-TN-D-2903
Unclassified report

Descriptors: (*Inelastic scattering, Electrons), (*Electron transitions, Hydrogen), (*Hydrogen, Inelastic scattering), Quantum mechanics.

N65-27273 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
DIRECTIONAL THERMAL-RADIATIVE PROPERTIES OF CONICAL CAVITIES,
by Leslie G. Polgar and John R. Howell. Jun 65, 27p NASA-TN-D-2904
Unclassified report

Descriptors: (*Conical bodies, Electromagnetic wave reflections), (*Electromagnetic wave reflections, Conical bodies).

N65-27819 Field 20F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
AN AUTOMATIC SYSTEM FOR DETERMINING SOLAR ABSORPTANCE AND THERMAL EMITTANCE OF SURFACES FROM SPECTRAL NORMAL REFLECTANCE MEASUREMENTS,
by Louis S. Teichman and Harold D. Burks. Jul 65, 11p NASA-TM-X-1113
Unclassified report

Descriptors: (*Spectrophotometers, Automatic).

N65-27820 Field 20B
CFSTI Prices: HC$3.00 MF$0.75

General Electric CO., Philadelphia, Pa. Missile and Space Div.
STUDY OF THE GROWTH PARAMETERS INVOLVED IN SYNTHESIZING BORON CARBIDE FILAMENTS,
by A. Gatti, C. Mancuso, E. Feingold, R. Mehan, and R. Cree. Jul 65, 57p
Contract NASw937
NASA CR-251
Unclassified report

Descriptors: (*Crystal growth, Single crystals), (*Boron compounds, Carbides).

N65-28691 Field 20D, 13G
CFSTI Prices: HC$6.00 MF$1.25

Sperry Utah Co., Salt Lake City, Utah.
ANALYTICAL INVESTIGATION OF FLUID AMPLIFIER DYNAMIC CHARACTERISTICS. VOLUME I.
Final rept., vol. 1,
by F. R. Goldschmied, D. L. Letham, C. E. Pearson, R. E. Esch, and T. J. Lechner. Jul 65, 213p
Contract NAS8 11236
NASA CR-244

Unclassified report

Descriptors: (*Amplifiers, Fluid flow), (*Fluid flow, Amplifiers), Fluid dynamic properties.

N65-28955 Field 20K
CFSTI Prices: HC$3.00 MF$0.75

Martin Co., Denter, Colo.
THE STABILITY OF SHALLOW SPHERICAL SHELLS UNDER CONCENTRATED LOAD,
by F. A. Penning and G. A. Thurston. Jul 65, 90p
Contract NASw912
NASA CR-265

Unclassified report

Descriptors: (*Structural shells, Loading(Mechanics)), (*Spheres, Loading(Mechanics)), (*Buckling(Mechanics), Stability).

N65-28956 Field 20K
CFSTI Prices: HC$3.00 MF$0.75

Martin Co., Denver, Colo.
THE BUCKLING STRENGTH OF FILAMENT-WOUND CYLINDERS UNDER AXIAL COMPRESSION,
by J. Tasi, A. Feldman, and D. A. Stang. Jul 65, 58p
Contract NASw912
NASA CR-266

Unclassified report

Descriptors: (*Cylindrical bodies, Buckling(Mechanics)), (*Filament wound construction, Tensile properties).

NCSC-2663-18 Field 20B, 18J
CFSTI Prices: HC$1.00 MF$0.50

North Carolina State Coll., Raleigh.
URANIUM INTERSTITIAL PHASES.
Quarterly rept.,
by J. V. Hamme, R. F. Stoops, and G. S. Sheffield. Sep 64, 18p EURAEC-1229
Contract AT(40-1)-2663

Unclassified report

Descriptors: (*Uranium, Phase studies), (*Phase studies, Uranium), Crystal lattices, Reactor fuels.

NYO-2504-3 Field 20B
CFSTI Prices: HC$1.00 MF$0.50

Cornell Univ., Ithaca, N. Y. Materials Science Center.
CREEP BY GRAIN BOUNDARY DIFFUSION,
by A. L. Ruoff. 7 Jan 65, 7p Rept. no. 298
Contract AT(30-1)-2179

Unclassified report

Descriptors: (*Grain boundaries, Diffusion), (*Creep, Crystals).

NYO-2504-4 Field 20B
CFSTI Prices: HC$1.00 MF$0.50

Cornell Univ., Ithaca, N. Y. Materials Science Center.
MASS TRANSFER PROBLEMS IN IONIC CRYSTALS. I. WITH CHARGE NEUTRALITY,
by A. L. Ruoff. 4 Jan 65, 20p Rept. no. 299
Contract AT(30-1)-2179

Unclassified report

Descriptors: (*Crystals, Ions), (*Transport properties, Crystals).

ORNL-3658 Field 20B, 7B
CFSTI Prices: HC$3.00 MF$0.50

Oak Ridge National Lab., Tenn.
ZONE MELTING OF INORGANIC FLUORIDES,
by A. J. Singh, H. G. Ross, and R. E. Thoma. Jul 65, 45p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Crystal growth, Zone melting), (*Fluorides, Zone melting), (*Zone melting, Fluorides).

Patent 3,201,585 Field 20G, 14B

MAGNETIC MOMENTUM ANALYZING SLIT WITH CURRENT CONDUCTING STRIPS SECURED TO THE MAGNETIC POLES.
Patent assigned to AEC,
by Joseph Ballam and En-Lung Chu.
17 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Charged particles, Separation), (*Particle accelerator components, Design), Particle beams, Magnetic fields, Magnetic moments, Particle accelerator techniques, Patents.

The particle separating device has a central aperture or slit wherein is generated an associated magnetic field. Field compensating current conductors are arranged to cancel the fringe field within a particle separating slit so that there is effectively zero field existing along a center-most portion thereof.

Patent 3,201,635 Field 20I

METHOD AND APPARATUS FOR PRODUCING A PLASMA.
Patent assigned to NASA,
by Arlen F. Carter. 17 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Plasma jets, Conductivity), Electric arcs, Conductivity, Patents.

The plasma accelerator provides a source of high-speed flow for aerodynamic testing and may be used as a propulsive system for space vehicles. Another application of the plasma is in the laboratory simulation of the plasma sheath which is formed around a hypersonic reentry vehicle. Apparatus is provided for seeding the produced jet with an easily ionizable material in order to increase the conductivity of the jet.

792-811 O - 65 - 18

PB-168 338 Field 20M, 16D
CFSTI Prices: HC$2,00 MF$0.50

Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
FORCED CONVECTION OF LIQUID HYDROGEN. PART 2 (CONTINUED). CASE OF LARGE TEMPERATURE DIFFERERENCES BETWEEN THE FLUID AND THE WALL (RECTANGULAR CHANNEL) (Convection Forcee de l'Hydrogene Liquide. 2eme Partie (Suite). Cas de Grands Ecarts de Temperatures Entre Fluide et Paroi (Canal Rectangulaire)),
by Paul Perroud and Jean Rebiere. Jul 65, 26p
Rept. no. CEA-R-2796
Unclassified report

Text in French, attached summary in English.

Descriptors: (*Liquefied gases, Convection), (*Nozzles, Cooling), Guided missile components, Simulation, Temperature, Heat transfer coefficients, Pressure, Mathematical analysis, France.

Liquid hydrogen flows in a canal of rectangular cross section of 1 x 6 mm; only one of the larger side is heated (length 190 mm) in order to simulate the cooling of a missile nozzle. The liquid is admitted subcooled at 25K in average and under a pressure of 8 bars. Mass velocity from 8.9 to 102 g/sq. cm. s, heat flux from 18 to 296.6 W/sq. cm. and wall temperature reaching 800K. Two correlations of local heat transfer coefficients are presented, one for the region in two-phase flow and the other for the region in homogeneous gas-phase which are compared with the formula previously established for a cylindrical canal. An analysis of pressure drop is also given. (Author)

PB-168 345 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
SURVEY OF U-C-Ni TERNARY DIAGRAM (Etude du Diagramme Ternaire U-C-Ni),
by Francois Anselin, Daniel Calais, and Jean-Claude Passefort. Aug 65, 32p Rept. no. CEA-R-2845
Unclassified report

Text in French with attached summary in English.

Descriptors: (*Phase studies, Uranium alloys), (*Uranium alloys, Phase studies), (*Nickel alloys, Phase studies), (*Carbides, Phase studies), Complex compounds, Carbon alloys.

The U-C-N; ternary diagram presents, in addition to the intermetallic compounds of U-Ni system and uranium carbides, two mixed carbides UC2Ni and U2C3Ni. The first carbide is decomposed from 1400 degrees C; the second is stable up to 1800 degrees C. (Author)

PB-168 346 Field 20G
CFSTI Prices: HC$2.00 MF$0.50

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
STUDY OF SOME TRANSVERSAL MOTIONS OF THE ELECTRON BEAM OF A LINAC (Etudes des Mouvements Transversaux du Faisceau d'Electrons dans un Accelerateur Lineaire),
by Roland Bergere, Hans Beil and Andre Veyssiere. Jul 65, 49p Rept. no. CEA-R-2843
Unclassified report

Text in French with attached summary in English.

Descriptors: (*Linear accelerators, Electron beams), (*Electron beams, Linear accelerators), Focusing, Magnetic fields, Waveguides, France.

It is well known that when the magnetic focusing field along the axis of an electron linac increases the output accelerated current does not increase regularly. Such a behaviour is shown to be connected with rotations, in the output plane of the linac, of the center of charges of the beam. These rotations have been displayed experimentally by means of a beam position monitoring system and related to the transverse momentum transfered to the beam by the spurious TM(11) mode existing in the input coupler changing the TE(01) mode from the input rectangular waveguide into a circular TM(01) mode on the accelerator structure. (Author)

PB-168 460 Field 20L
CFSTI Prices: HC$1.00 MF$0.50

Pennsylvania Univ., Philadelphia.
SEMICONDUCTOR RESEARCH.
Bi-monthly progress rept. for 1 Mar-30 Apr 50,
by P. H. Miller, Jr. 1 Jun 50, 25p
Contract NObsr42487 Unclassified report
ATI 86 839
Available copy will not permit fully legible reproduction.

Descriptors: (*Semiconductors, Physical properties), Work function, Electrical conductance, Hall effect, Noise(Radio), Crystal lattice defects, Photoconductivity, Selenium, Impurities, Crystallization, Low-temperature research.

Progress is summarized of the various investigations carried out on semiconductors. Experiments were carried out in the study of the work function of semiconductors, of the electrical conductivity which will be implemented by the development of homogenous samples of known purity content, and studies were carried out on the Hall effect as a function of temperature. Additional theoretical and experimental explorations were made of the phenomena underlying the noise spectrum produced by the modulation of the current flowing through a semiconductor metal contact, and of the nature of lattico defects in semiconductors, as well as a study of photoconductivity of semiconductors, especially at low temperatures. A detailed study was also made of the conductivity of selenium doped with metals and non-metals, and a study of the crystallization habits of pure and doped selenium. (Author)

SC-TM-64-1714 Field 20F, 20M
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
OPTICAL CRYOSTAT FOR USE WITH BEAM CONDENSERS,
by R. S. Neiman. Nov 64, 4p Unclassified report
Contract AT(29-1)-789

Descriptors: (*Spectrophotometers, Cryostats), (*Cryostats, Spectrophotometers).

SIT-134 Field 20I
CFSTI Prices: HC$3.00 MF$0.75

Stevens Inst. of Tech., Hoboken, N. J. Dept. of Physics.
WAVES AND INSTABILITIES IN BOUNDED PLASMAS.
Plasma physics chap. 7,
by George Schmidt. 1964, 79p
Contract AT(30-1)-2813
Unclassified report

Descriptors: (*Plasma medium, Stability), (*Plasma oscillations, Stability).

SLAC-34 Field 20G
CFSTI Prices: HC$2.50 MF$1.00

Stanford Linear Accelerator Center, Stanford Univ., Calif.
TWO-MILE ACCELERATOR PROJECT.
Quarterly status rept, 1 Jul-30 Sep 64.
Jan 65, 117p
Contract AT(04-3)-400
Unclassified report

Descriptors: (*Linear accelerators, Electron accelerators), (*Electron accelerators, Linear accelerators).

SU-247-4 Field 20M, 20D
CFSTI Prices: HC$6.00 MF$1.50

Stanford Univ., Calif Thermosciences Div.
THE EFFECT OF LARGE TEMPERATURE GRADIENTS ON TURBULENT FLOW OF GASES IN THE THERMAL ENTRANCE REGION OF TUBES.
Technical rept.,
by Patrick M. Magee. Oct 64, 243p
Contract AT(04-3)-247
Unclassified report

Descriptors: (*Heat transfer, Turbulence), (*Gas flow, Turbulence).

SU-ML-1238 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Stanford Univ., Calif Microwave Lab.
STUDIES OF PLASMA OSCILLATIONS.
Quarterly status rept. no. 19, 1 Jun-31 Aug 64.
Oct 64, 15p
Contract AT(04-3)-326
Unclassified report

Descriptors: (*Plasma oscillations, Reports).

SU-ML-1261 Field 20I
CFSTI Prices: HC$2.00 MF$0.75

Stanford Univ., Calif. Microwave Lab.
STRUCTURE OF THE DOUBLE-SHEATH IN A HOT-CATHODE PLASMA,
by F. W. Crawford and A. B. Cannara.
Nov 64, 46p CONF-641210-1
Contract AT(04-3)-326
Unclassified report

Presented at American Physical Society Meeting, Berkeley, Calif., Dec 64.

Descriptors: (*Plasma sheath, Configuration).

SU-SEL-64-091 Field 20I
CFSTI Prices: HC$5.00 MF$1.00

Stanford Univ., Calif. Stanford Electronics Labs.
SHEET-PINCH STABILITY,
by Donald R. Dobrott. Aug 64, 157p
SU-SEL-TR-0256-3
Contract AT(04-3)-326
Unclassified report

Descriptors: (*Magnetic pinch, Stability).

SU-SEL-64-103 Field 20
CFSTI Prices: HC$6.00 MF$1.25

Stanford Univ., Calif. Stanford Electronics Labs.
QUARTERLY RESEARCH REVIEW NO. 10, 1 JULY 30 September 64.
1964, 218p
Contract AT(04-3)-326
Unclassified report

Descriptors: (*Physics, Reviews).

TID-3043 (Rev 2) (Suppl 2) Field 20H, 5B
CFSTI Prices: HC$4.00 MF$0.75

Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
BIBLIOGRAPHIES OF INTEREST TO THE ATOMIC ENERGY PROGRAM.
comp. by Richard J. Smith, Hugh E. Voress and Naomi K. Smelcer. Nov 64, 108p
Unclassified report

Descriptors: (*Nuclear physics, Bibliographies), (*Bibliographies, Nuclear physics).

TID-21430 Field 20K, 11B
CFSTI Prices: HC$3.00 MF$0.75

Southern Research Inst., Birmingham, Ala.
THE TRUE STRESS-STRAIN PROPERTIES OF BRITTLE MATERIALS TO VERY HIGH TEMPERATURES.
Final rept. 1963-1964.
30 Oct 64, 94p SRIB-6995-1190-47
Contract AT(40-1)-2694
Unclassified report

Descriptors: (*Heat resistant materials, Stresses).

TID-21549 Field 20F, 7D
CFSTI Prices: HC$4.00 MF$1.00

Cornell Univ., Ithaca, N. Y. Materials Science Center.
STARK EFFECTS IN PARAMAGNETIC RESONANCE.
Doctoral thesis,
by Stanley Howard Christensen. Sep 63, 129p
Rept. no. 142
Contract AT(30-1)-2179
Unclassified report

Descriptors: (*Paramagnetic resonance, Line spectrum).

TID-21672 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Yale Univ., New Haven, Conn.
SUMMARY OF PROGRESS REPORT DURING YEARLY PERIOD ENDING IN FEBRUARY 1965,
by McAllister H. Hull, Jr., and Gregory Breit.
1965, 13p
Contract AT(30-1)-1807
Unclassified report

Descriptors: (*Nuclear reactions, Elementary particles), (*Elementary particles, Nuclear reactions).

TID-21716 Field 20H, 7E
CFSTI Prices: HC$1.00 MF$0.50

State Univ. of New York, Stony Brook. Dept. of Chemistry.
NUCLEAR REACTIONS STUDIES.
Progress rept. for year ending 31 May 65.
1965, 23p Unclassified report
Contract AT(30-1)-3403

Descriptors: (*Nuclear reactions, Reviews), (*Radiochemistry, Reviews).

UCRL-11002 Field 20B
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
TOPOTAXY IN THE ANATASE-RUTILE TRANSFORMATION,
by Robert D. Shannon and Joseph A. Pask.
30 Jan 64, 27p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Symmetry(Crystallography), Phase studies), (*Phase studies, Crystals).

UCRL-12225-T Field 20M
CFSTI Prices: HC$3.00 MF$0.75

California Univ., Berkeley. Dept. of Mineral Technology.
VAPOR SPECIES OF THE BARIUM - OXYGEN - HYDROGEN SYSTEM.
Doctoral thesis,
by Ray Selmer Newbury. 16 Dec 64, 74p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Vapors, Barium compounds), (*Oxygen compounds, Hydrogen compounds).

WAPD-TM-465 Field 20M, 9B
CFSTI Prices: HC$3.00 MF$0.75

Bettis Atomic Power Lab., Pittsburgh, Pa.
HOT-1: A TWO-DIMENSIONAL STEADY-STATE HEAT CONDUCTOR PROGRAM FOR THE PHILCO-2000,
by R. B. Smith and J. Spanier. Jul 64, 64p
Contract AT-11-1-GEN-14

Unclassified report

Descriptors: (*Thermal conductivity, Programming-(Computers)), (*Programming(Computers), Thermal conductivity).

21. Propulsion and Fuels

N65-17993 Field 21I, 13L
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
PRELIMINARY INVESTIGATION OF FIRE AND EXPLOSION HAZARDS ASSOCIATED WITH S-II INSULATION,
by C. F. Key and J. B. Gayle. 2 Oct 64, 23p
NASA-TM-X-53144

Unclassified report

Descriptors: (*Hazards, Fuel tanks), (*Composite materials, Fuel tanks), Launch vehicles(Aerospace), Liquefied gases.

N65-19273 Field 21I, 20K
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
NONMONOTONICITY IN SENSITIVITY TEST DATA,
by J. B. Gayle. 22 Jan 65, 13p NASA-TM-X-53194

Unclassified report

Descriptors: (*Composite materials, Tests), (*Impact shock, Tests), Liquefied gases, Fuel tanks, Toughness.

N65-19275 Field 21I, 21H, 11F, 11D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
EFFECT OF LIQUID NITROGEN DILUTION ON LOX IMPACT SENSITIVITY,
by C. F. Key and J. B. Gayle. 15 Feb 65, 31p
NASA-TM-X-53208

Unclassified report

Descriptors: (*Toughness, Cryogenics), (*Liquefied gases, Compatibility), Nitrogen, Oxygen, Sensitivity, Impact shock, Chemical reactions, Materials.

N65-20109 Field 21I, 13L
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Cocoa Beach, Fla. John F. Kennedy Space Center.
SOLID PROPELLANTS SAFETY HANDBOOK.
1 Feb 65, 63p NASA-TM-X-56192; SP-4-45-S

Unclassified report

Descriptors: (*Handbooks, Safety), (*Propellants, Safety).

N65-21470 Field 21C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ELECTROSTATIC THRUSTORS,
by Harold R. Kaufman. 8 Apr 64, 14p
NASA-TM-X-51747

Unclassified report

Descriptors: (*Ion engines, Reviews).

N65-23159 Field 21H
CFSTI Prices: HC$4.00 MF$0.75

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
EXPERIMENTAL AND ANALYTICAL STUDIES OF CRYOGENIC PROPELLANT TANK PRESSURANT REQUIREMENTS,
by M. E. Nein and J. F. Thompson. 25 Feb 65, 109p
NASA-TM-X-53165

Unclassified report

Descriptors: (*Propellant tanks, Liquid rocket propellants), (*Gases, Pressure vessels), (*Cryogenics, Propellant tanks).

N65-23717 Field 21C
CFSTI Prices: HC$1.00 MF$0.50

Rocket Power, Inc., Pasadena, Calif.
RESEARCH ON CHARGED COLLOID PROPULSION.
Summary rept.,
by S. P. Harris. 1 Feb 1965, 24p
Contract NAS3-2597
NASA cr-54192

Unclassified report

Descriptors: (*Colloids, Ion engines), (*Ion engines, Colloids), Propulsion, Ion sources, Particle beams.

N65-23738 Field 21H
CFSTI Prices: HC$6.00 MF$1.50

Little (Arthur D.), Inc., Cambridge, Mass.
BASIC INVESTIGATION OF MULTI-LAYER INSULATION SYSTEMS.
Final rept.,
by Igor A. Black. 30 Oct 64, 298p ADL-65958-00-04
Contract NAS3-4181
NASA CR-54191
Unclassified report

Descriptors: (*Fuel tanks, Thermal insulation), (*Fuel rocket fuels, Fuel tanks), (*Liquified gases, Fuel tanks).

N65-24056 Field 21E, 21D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
USE OF HIGHLY REACTIVE CHEMICAL ADDITIVES TO IMPROVE AFTERBURNER PERFORMANCE AT ALTITUDE,
by John P. Wanhainen and Joseph N. Sivo.
30 Sep 58, 25p NACA-RM-E58G10
Unclassified report

Descriptors: (*Afterburners, Turboject engines), (*Fuel additives, Jet engine fuels.

N65-24302 Field 21H, 21I
CFSTI Prices: HC$3.00 MF$0.75

Little (Arthur D) Inc., Cambridge, Mass.
THERMAL PROTECTION SYSTEMS FOR LIQUID HYDROGEN TANKS,
by Peter E. Glaser. Nov 1962, 64p C-65008-3
Contract NAS5-664
NASA CR-62859
Unclassified report

Descriptors: (*Fuel tanks, Thermal insulation), (*Thermal insulation, Fuel tanks), (*Liquid rocket fuels, Fuel tanks).

N65-26412 Field 21H, 20M
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EXPERIMENTAL INVESTIGATION OF HOT-GAS SIDE HEAT-TRANSFER RATES FOR A HYDROGEN-OXYGEN ROCKET,
by Ralph L. Schacht, Richard J. Quentmeyer, and William L. Jones. Jun 65, 22p
NASA-TN-D-2832
Unclassified report

Descriptors: (*Heat transfer, Rocket motor nozzles), (*Rocket motor nozzles, Heat transfer).

N65-26601 Field 21H, 21B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
A MIXING MODEL FOR ROCKET ENGINE COMBUSTION,
by Martin Hersch. Jun 65, 24p NASA-TN-D-2881
Unclassified report

Descriptors: (*Rocket motors, Combustion), (*Combustion, Rocket motors).

N65-26647 Field 21C
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ARC-JET THRUSTOR FOR SPACE PROPULSION,
by Lewis E. Wallner and Joseph Czika, Jr.
Jun 65, 69p NASA-TN-D-2868
Unclassified report

Descriptors: (*Space propulsion, Arc-jet engines), (*Arc-jet engines, Space propulsion).

N65-28953 Field 21I, 18H, 21F
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ANALYTICAL AND EXPERIMENTAL STUDY OF NUCLEAR HEATING OF LIQUID HYDROGEN,
by Bernhard H. Anderson and Ronald L. Danilowicz.
Jul 65, 41p NASA-TN-D-2934
Unclassified report

Descriptors: (*Nuclear energy, Heating), (*Heating, Nuclear energy), (*Liquid rocket propellants, Heating), Hydrogen.

N65-28954 Field 21G
CFSTI Prices: HC$6.00 MF$1.25

Vickers, Inc., Detroit, Mich.
DEVELOPMENT OF A HYDROGEN-OXYGEN INTERNAL COMBUSTION ENGINE SPACE POWER SYSTEM.
Rept. for 1 Jul 63-31 Aug 64,
by N. E. Morgan and W. D. Morath. Jul 65, 200p
Contract NAS3 2787
NASA CR-255
Unclassified report

Descriptors: (*Internal combustion engines, Space propulsion), (*Space propulsion, Internal combustion engines).

Patent 3,199,295 Field 21H

CONICAL VORTEX INJECTION AND COMBUSTION DEVICE FOR REACTION MOTORS.
Patent assigned to Army,
by Joseph W. Connaughton. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Injectors, Rocket components), (*Combustion chambers, Rocket components), Rocket motors(Liquid propellant), Gaseous rocket propellants, Vortices, Jet mixing flow, Conical bodies, Atomization, Vaporization, Patents.

The injection device is for reaction motors or rocket engines. It utilizes a vortex flow to provide for the mixing, vaporization, and/or atomization of fluid propellants. The device serves as an injector and combustion chamber for liquid or gas fueled reaction motors. The conically shaped part of the injector serves as the combustion chamber.

Patent 3,200,886 Field 21E, 1C

DROOP COMPENSATED FUEL CONTROL SYSTEM.
Patent assigned to Navy,

by Joseph L. Magri and Herbert N. Shohet. 17 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Fuel systems, Helicopter engines), (*Helicopter engines, Fuel systems), Gas turbines, Engine clusters, Engine fuel systems components, Control systems, Patents.

The fuel control system is for plural gas turbine engines in a helicopter. Two twin axial flow gas turbine engines are shown. The system has transient and steady-state speed droop compensation which is easily adjustable for obtaining uniform operation of the two engines which differ from each other in their performance characteristics.

22. Space Technology

N65-17541 Field 22A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
CISLUNAR METEOROID IMPACT AND PUNCTURE MODELS WITH PREDICTED PEGASUS SATELLITE PUNCTURES,
by Charles C. Dalton. 13 Jan 65, 32p
NASA-TM-X-53187
Unclassified report

Descriptors: (*Meteors, Penetration), (*Satellites-(Artificial), Penetration), Space environmental conditions.

N65-17542 Field 22D, 21F
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
ADVANCED POST-SATURN EARTH LAUNCH VEHICLE STUDY.
Executive summary rept.,
by J. L. Sanders. 3 Feb 65, 27p NASA-TM-X-53200
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Tests), Nuclear propulsion.

N65-17994 Field 22B, 9B, 20M
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
A FORTRAN PROGRAM TO CALCULATE AN ENGINEERING ESTIMATE OF THE THERMAL RADIATION TO THE BASE OF A MULTI-ENGINE SPACE VEHICLE AT HIGH ALTITUDES,
by E. R. Heatherly, M. J. Bash, G. R. Davidson, and C. A. Rafferty. 5 Oct 64, 93p NASA-TM-X-53148
Unclassified report

Descriptors: (*Programming(Computers), Thermal radiation), (*Thermal radiation, Spacecraft), Exhaust gases, High altitude.

N65-18957 Field 22A, 9B
CFSTI Prices: HC$11.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Center.
AOPB SYSTEMS MANUAL PROGRAM DESCRIPTION. IBM 1401 SELECTIVE TAPE TO CARD,
by Patricia Ann Savage. Aug 64, 11p
NASA-TM-X-55169, X-542-64-261
Unclassified report

Descriptors: (*Programming(Computers), Astronautics), (*Data processing systems, Astronautics).

N65-18959 Field 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
INSTRUMENTATION REPORT ON NIKE-APACHE FLIGHT 14.127 GI,
by R. W. Conrad and J. W. Cameron. Oct 64, 26p
NASA-TM-X-55172; X-671-64-298
Unclassified report

Descriptors: (*Sounding rockets, Instrumentation).

N65-19694 Field 22A, 5A
CFSTI Prices: HC$4.00 MF$1.00

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
A PROCEDURE TO ANALYZE AND EVALUATE ALTERNATIVE SPACE PROGRAM PLANS,
ed. by H. H. Koelle and R. G. Voss. 3 Mar 65, 127p
NASA-TM-X-53212
Unclassified report

Descriptors: (*Astronautics, Management planning), Simulation, Effectiveness, Costs.

N65-19695 Field 22A, 5I
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SCIENTIFIC EXPLORATION OF SPACE AND ITS CHALLENGES TO EDUCATION,
by Harry J. Goett. 1964, 27p Unclassified report
NASA-TM-X-56149
Address presented at Centennial Convocation Luncheon, Worchester Polytech Inst., Mass., 3 Oct 64.

Descriptors: (*Education, Astronautics), (*Astronautics, Education).

N65-21469 Field 22A, 5I
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
SOME LANGLEY RESEARCH CENTER PLANS IN THE AREA OF VISUAL DISPLAYS FOR LUNAR MISSION SIMULATION,
by Donald R. Riley and Byron M. Jaquet. 1964, 22p
NASA-TM-X-51758
Unclassified report

Presented at the 1964 Ann. Meeting of the Armed Forces-NRC Comm. on Vision, Washington, 23-24 Apr 1964.

Descriptors: (*Lunar craft, Flight simulators), (*Flight simulators, Display systems).

N65-22353 Field 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
EFFECTS OF NUCLEAR RADIATION, CRYOGENIC TEMPERATURE, AND VACUUM ON THE ELECTRICAL PROPERTIES OF DIELECTRIC MATERIALS,
by R. L. Gause and E. C. McKannan. 30 Mar 65, 34p
NASA-TM-X-53230
Unclassified report

Descriptors: (*Dielectrics, Materials), (*Space environmental conditions, Dielectrics), Low pressure research, Cryogenics, Radiation damage.

N65-22542 Field 22C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
INFLUENCE OF SOLAR RADIATION PRESSURE ON ORBITAL ECCENTRICITY OF A GRAVITY-GRADIENT ORIENTED LENTICULAR SATELLITE,
by W. F. Hodge. 1965, 16p NASA-TM-X-56549
Unclassified report

Presented at Symp. on Passive-Gravity-Gradient Stabilization, Moffett Field, Calif., 10-11 May 1965.

Descriptors: (*Communication satellites(Passive), Orbital trajectories, (*Solar radiation, Communication satellites(Passive)), Inflatable structures.

N65-22543 Field 22D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN MONTHLY PROGRESS REPORT (JANUARY 16, 1964 - FEBRUARY 16, 1964).
29 Feb 1964, 22p NASA-TM-X-56339; MPR-SAT-64-2
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Reviews).

N65-22546 Field 22D
CFSTI Prices: HC$6.00 MF$1.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN C-1 FAILURE EFFECT ANALYSIS FOR SA-5 AND COMPLEX 37-B.
1962, 293p NASA-TM-X-56342
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Reliability).

N65-22547 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN C-1 ENVIRONMENTAL CRITERIA (BLOCK II AND SUBS).
9 Mar 62, 47p NASA-TM-X-56341; IN-M-P+VE-V-62-1
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Controlled atmospheres).

N65-22553 Field 22D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN MONTHLY PROGRESS REPORT, AUGUST 15-SEPTEMBER 18, 1963,
by Oswald H. Lange. 20 Sep 63, 22p
NASA-TM-X-56316; MPR-SAT-63-12
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Reviews).

N65-22554 Field 22D
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN IB MISSION PLAN AND TECHNICAL INFORMATION CHECK LIST, VOLUME II.
1st rev.
1 Mar 64, 78p NASA-TM-X-56315
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Checkout procedures).

N65-22555 Field 22D, 9E
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN I ELECTRICAL POWER AND SYSTEMS INTEGRATION SA-5 THROUGH SA-7,
by A. A. Conway and H. K. Bennett. 25 Mar 63, 75p
NASA-TM-X-56314; MTP-ASTR-E-63-5
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Electrical equipment).

N65-22560 Field 22D
CFSTI Prices: HC$2.00 MF$0.75

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN IB MISSION PLAN AND TECHNICAL INFORMATION CHECKLIST, VOLUME II.
3rd Rev.,
by John O. Aberg. 1 Sep 64, 81p
NASA-TM-X-56340; R-P-VE-VAS-64-155
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Checkout procedures).

N65-22564 Field 22D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN MONTHLY PROGRESS REPORT, DECEMBER 16, 1963-JANUARY 16, 1964,
by Lee B. James and Arthur Rudolph. 5 Feb 1964, 19p NASA-TM-X-56338; MPR-SAT-64-1
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Reviews).

N65-22847 Field 22D
CFSTI Prices: HC$7.34 MF$2.25

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
MINUTES OF THE VEHICLE MECHANICAL DESIGN INTEGRATION WORKING GROUP MEETING NO. 6, S-IVB STAGE (SATURN IB/V),
by Roland F. Griner. 14 Oct 64, 434p
NASA-TM-X-56359, R-P-VE-XJ-64-659
Unclassified report

Meeting held at Huntington Beach, Calif., 26-27 Aug 1964.

Descriptors: (*Launch vehicles(Aerospace), Symposia).

N65-23068 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

Chrysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME III: LH2 FUEL SYSTEM FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS AND MECHANICAL SCHEMATICS.
Aug 64, 62p SDES-64-415, vol. 3
Contract NAS8-4016
NASA CR-62490
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Fuel systems).

N65-23069 Field 22D
CFSTI Prices: HC$3.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME VI: ENVIRONMENTAL CONDITIONING SYSTEMS FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
May 64, 56p SDES-64-414, Vol 6
Contract NAS8-4016
NASA CR-62489
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Air conditioning equipment).

N65-23070 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME VII: LAUNCH PAD ACCESSORIES FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Jul 64, 43p SDES-64-415, vol. 7
Contract NAS8-4016
NASA CR-62488
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Launching sites).

N65-23073 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME IX: RL10A-3 ENGINE AND HYDRAULIC SYSTEM FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
May 64, 29p SDES-64-414, vol. 9
Contract NAS8-4016
NASA CR-62604
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Rocket components).

N65-23074 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME IX: RL10A-3 ENGINE AND HYDRAULIC SYSTEM FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Aug 64, 29p SDES-64-415 Vol 9
Contract NAS8-4016
NASA CR-62505
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Rocket components).

N65-23113 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

Chrysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME II: LOX SYSTEM FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Aug 64, 65p SDES-64-415 Vol 2
Contract NAS8-4016
NASA CR-62494
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Liquid rocket oxidizers).

N65-23114 Field 22D
CFSTI Prices: HC$4.00 MF$0.75

Chysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME V: PNEUMATIC DISTRIBUTION SYSTEM, FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
May 64, 107p SDES-64-414 Vol 5
Contract NAS8-4016
NASA CR-62501
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Pneumatic systems).

N65-23115 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME V: PNEUMATIC DISTRIBUTION SYSTEM, FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS,

Aug 64, 97p SDES-64-415 Vol 5
Contract NAS8-4016
NASA CR-62496

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Pneumatic systems).

N65-23116 Field 22D
CFSTI Prices: HC$3.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN I, LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOL. VI: ENVIRONMENTAL CONDITIONING SYSTEMS, FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Aug 64, 57p SDES-64-415, vol. 6
Contract NAS8-4016
NASA CR-62493

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Air conditioning equipment), (*Air conditioning equipment, Launch vehicles(Aerospace)).

N65-23117 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME VII: LAUNCH PAD ACCESSORIES-FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
May 64, 44p SDES-64-414
Contract NAS8-4016
NASA CR-62492

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Launching sites).

N65-23118 Field 22D
CFSTI Prices: HC$1.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME X: SEPARATION AND FLIGHT TERMINATION SYSTEMS FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Aug 64, 22p SDES-64-415, Vol 10
Contract NAS8-4016
NASA CR-62495

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Staging).

N65-23183 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME 1: RP-1 FUEL SYSTEM FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
15 Apr 64, 43p SDES-64-414 Vol 1
Contract NAS8-4016
NASA CR-62517

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Fuel systems), (*Fuel systems, Launch vehicles(Aerospace)).

N65-23184 Field 22D
CFSTI Prices: HC$3.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME I: RP-1 FUEL SYSTEM FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Jul 64, 52p SDES-64-415, vol. 1
Contract NAS8-4016
NASA CR-62524

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Fuel systems), (*Fuel systems, Launch vehicles(Aerospace)).

N65-23185 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

Chrysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME II: LOX SYSTEM FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Apr 64, 84p SDES-64-414, vol. 2
Contract NAS8-4016
NASA CR-62523

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Oxidizers), (*Oxidizers, Launch vehicles(Aerospace)).

N65-23186 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME III: LH2 FUEL SYSTEM FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
May 64, 68p SDES-64-414 Vol 3
Contract NAS8-4016
NASA CR-62528

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Fuel systems), (*Fuel systems, Launch vehicles(Aerospace)).

N65-23187 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEM DESCRIPTION. VOLUME IV: NITROGEN AND HELIUM STORAGE FACILITY FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Apr 64, 94p SDES-64-414 Vol 4
Contract NAS8-4016
NASA CR-62516

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Gases), (*Tanks(Containers), Gases).

N65-23188 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME IV: NITROGEN AND HELIUM STORAGE

FACILITY FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS, AND MECHANICAL SCHEMATICS.
Jul 64, 43p SDES-64-415, vol. 4
Contract NAS8-4016
NASA CR-62525

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Gases), (*Containers, Gases).

N65-23190 Field 22D
CFSTI Prices: HC$1.00 MF$0.50

Chrysler Corp., New Orleans, La. Space Div.
SATURN I LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME X: SEPARATION AND FLIGHT TERMINATION SYSTEMS FUNCTIONAL DESCRIPTION, INDEX OF FINDING NUMBERS AND MECHANICAL SCHEMATICS.
Apr 64, 17p SDES-64-414, vol. 10
Contract NAS8-4016
NASA CR-62526

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Electrical equipment).

N65-23208 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

Chrysler Corp., New Orleans, La. Space Div.
SATURN 1 LAUNCH VEHICLE SA-10 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. VOLUME XI: LEGEND AND COMPOSITE SCHEMATIC.
Sep 64, 67p SDES-64-415 Vol 11
Contract NAS8-4016
NASA CR-62513

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Electrical equipment).

N65-23279 Field 22C. 22B
CFSTI Prices: HC$4.00 MF$1.00

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
RANGER 5 TRACKING SYSTEMS DATA ANALYSIS. Final rept.,
by C. E. McNeal. 15 Apr 1965, 138p JPL-TR-32-702
Contract NAS7-100
NASA CR62608

Unclassified report

Descriptors: (*Lunar craft, Tracking), (*Tracking, Lunar craft).

N65-23281 Field 22A
CFSTI Prices: HC$7.00 MF$2.00

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SPACE PROGRAMS SUMMARY NO. 37-32, VOLUME IV FOR THE PERIOD DECEMBER 1, 1964 TO JANUARY 31, 1965. SUPPORTING RESEARCH AND ADVANCED DEVELOPMENT,
by W. H. Pickering. 28 Feb 1965, 392p
JPL-SPS-37-31 Vol 4
Contract NAS7-100
NASA CR-62607

Unclassified report

Descriptors: (*Space flight, Scientific research).

N65-23796 Field 22C
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SA-8 OPERATIONAL TRAJECTORY,
by Pamelia B. Pack and Gordon W. Solmon. 17 May 1965, 48p NASA-TM-X-53262

Unclassified report

Descriptors: (*Orbital trajectories, Scientific satellites).

N65-23923 Field 22A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Edwards, Calif. Flight Research Center.
RESUME OF HANDLING QUALITIES OF THE X-15 AIRPLANE,
by Robert M. White, Glenn H. Robinson, and Gene J. Matranga. Mar 62, 19p Unclassified report
NASA-TM-X-715
Descriptors: (*Aerospace planes, Control).

N65-23930 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

Air Products and Chemicals, Inc., Allentown, Pa.
A DESIGN STUDY OF A HELIUM RECOVERY SYSTEM FOR MILA. VOLUME I: SYNOPSIS.
1965, 42p
Contract NAS10-1472 Unclassified report
NASA CR-62747
Descriptors: (*Helium, Purification), (*Rocket launchers, Helium).

N65-24020 Field 22A, 9B
CFSTI Prices: HC$4.00 MF$0.75

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
MONTE CARLO PERFORMANCE ANALYSIS COMPUTER PROGRAM WITH PROGRAMMED MIXTURE RATIO,
by Roy C. Lester. 22 Mar 65, 110p
NASA-TM-X53222

Unclassified report

Descriptors: (*Monte Carlo method, Programming-(Computers), (*Astronautics, Programming(Computers)).

N65-24026 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

Air Products and Chemicals, Inc., Allentown, Pa.
A DESIGN STUDY OF A HELIUM RECOVERY SYSTEM FOR MILA. VOLUME III: HELIUM USAGE AND RECOVERY EQUIPMENT SUPPORTING DATA.
1965, 98p
Contract NAS10-1472
NASA CR-6279

Unclassified report

Descriptors: (*Helium, Purification), (*Rocket launchers, Helium).

N65-24034 Field 22B, 22A
CFSTI Prices: HC$2.00 MF$0.50

Allied Research Associates, Inc., Concord, Mass.

DEVELOPMENT AND APPLICATION OF BASIC ANALYTICAL PRINCIPLES FOR MATERIALS AND DESIGN SYNTHESIS TO ADVANCED CONCEPTS FOR SPACE AND LAUNCH VEHICLES.
Quarterly Progress Report, no. 268-1, 23 Mar-23 Jun 64,
by Roger Milligan. 19 Jun 64, 47p
Contract NASw-928
NASA CR-56698
Unclassified report

Descriptors: (*Spacecraft, Landing gear), (*Astronautics, Engineering).

N65-25596 Field 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
LOW-SPEED WIND-TUNNEL TESTS OF A LARGE-SCALE INFLATABLE STRUCTURE PARAGLIDER,
by Berl Gamse, Kenneth W. Mort, and Paul F. Yaggy. Jun 65, 30p NASA-TN-D-2859
Unclassified report

Descriptors: (*Recovery vehicles, Gliders), (*Gliders, Inflatable structures).

N65-26251 Field 22B
CFSTI Prices: HC$5.00 MF$1.25

Research and Advanced Development Div., AVCO Corp., Wilmington, Mass.
A STUDY OF THERMO-STRUCTURAL DESIGN CONCEPTS FOR LIFTING ENTRY VEHICLES,
by J. Newell. Jun 65, 165p
Contract NAS1 3531
NASA CR-240
Unclassified report

Descriptors: (*Reentry vehicles, Aerodynamic configurations), (*Atmosphere entry, Spacecraft).

N65-26626 Field 22B
CFSTI Prices: HC$3.00 MF$0.75

Astro Research Corp., Santa Barbara, Calif.
THE ROTORNET: A HIGH-PERFORMANCE HYPERSONIC DECELERATOR FOR PLANETARY ENTRY,
by A. C. Kyser. Jun 65, 83p
Contract NAS7 272
NASA CR-247
Unclassified report

Descriptors: (*Reentry vehicles, Deceleration), (*Flight control systems, Reentry vehicles).

N65-26629 Field 22D, 16D
CFSTI Prices: HC$9.36 MF$3.00

Martin Co., Denver, Colo.
COMPILATION OF SHOCK, VIBRATION, AND ACOUSTIC DATA FROM TITAN VEHICLES. VOLUME II. TITAN I ACOUSTIC AND VIBRATION DATA.
Jan 65, 633p Rept. no. Martin-CR-64-86, vol. 2
Contract NAS1 4312
NASA CR-62001 Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Aerodynamic characteristics), (*Guided missiles(Surface-to-Surface), Aerodynamic characteristics).

Patent 3,202,998 Field 22B, 9E

FLEXIBLE FOAM ERECTABLE SPACE STRUCTURES.
Patent assigned to NASA,
by Edward L. Hoffman. 24 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Satellites(Artificial), Inflatable structures), (*Flexible structures, Yagi antennas), Expanded plastics, Patents.

The self-erectable director assembly for Yagi disk antennas is utilizable on space satellites. An open cellular flexible foam is used as the primary support and erection mechanism for an erectable space structure. The structure is immune to micrometeroid damage.

Patent Design 201, 773 Field 22D

RECOVERABLE SINGLE STAGE SPACECRAFT BOOSTER.
Patent assigned to NASA, Unclassified patent
by Philip Bono. 27 Jul 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Launch vehicles(Aerospace), Recoverable booster motors), (*Recoverable booster motors, Launch vehicles(Aerospace)), Design, Patents.

The spacecraft booster is attached to a space capsule. The body configuration of the booster is cylindrical. The main cylindrical body has eight smaller cylindrical devices attached to it, the elements being spaced equidistant from each other.

SB-546 Field 22B

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
SPACE ENVIRONMENTAL CONDITIONS (MATERIALS).
Price list, selective bibliography of government research repts. and translations for 1958-Jul 65.
Jul 65, 16p Unclassified report

Available free from the Clearinghouse.

Descriptors: (*Space environmental conditions, Materials), (*Materials, Space environmental conditions), Spacecraft, Environmental tests.

Lists 203 references on space environmental effects on materials addedto the CFSTI collection during the period 1958 through July 1965. Covers research on vacuum and ultraviolet radiation on mechanical behavior of materials and structures; effects of low pressure, high temperatures, shock, vibration and impact; effects on adhesives, elastomers, plastics, seals, lubrication, electrical contacts, gears and bearings; cold welding in vacuum; paint coatings in space conditions, among other subjects.

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